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[SPECIAL OFFICIAL NOTICE.]

Bureau of Information, American Gas Institute.

DETROIT CITY GAS COMPANY,
ENGINEERING DEPARTMENT,
DETROIT, MICH., Nov. 26th, 1909.

To the Members, American Gas Institute: Send questions to be submitted to the Bureau of Information for answer to V. F. Dewey, Chairman, Gas Office Building, Detroit, Mich. The Bureau of Information respectfully solicits your troubles. Yours respectfully,

V. F. DEWEY, Chairman.

BRIEFLY TOLD.

THE MEETING OF THE NATIONAL COMMERCIAL GAS ASSOCIATION.—Excellent progress is reported by all those concerned in arranging for the joint meeting of the National Commercial Gas Association and the exhibition of gas apparatus and appliances in connection therewith, that will be given at the Madison Square Garden this city, commencing next week. As far as alertness, energy and well-directed work, backed by ample financial aid, can be counted on to make anything complete, this exhibition is to be complete. The fraternity may accept it as a fact, positive and unchangeable, that this meeting and exhibition will be on a scale of magnitude and completeness heretofore not reached by any kindred undertakings. One thing in connection with the whole affair cannot be too strongly impressed upon the thought of those who propose to be present during the continuance of the display is that they should all be present at the sessions and display that are down for the opening evening—the day, date and hour for which are Tuesday, December 14th, at 8 P.M. On the list of speakers are the names of men of international fame, such names as that of Hon. George B. Cortelyou, formerly an executive head of ex-President Roosevelt's remarkable cabinet, and now President of the Consolidated Gas Company; the Hon. Leslie M. Shaw, the Hon. T. N. McCarter (he is also chief of one of the largest public utilities corporations in the country), and others whose fame in the land is little less than that of those named. It is your duty to be present, in the end that that attendance will prove agreeable and satisfactory as well.

PUBLICITY.—The desire of our citizens for greater publicity regarding public utilities is a natural sequence to the series of melodramatic investigations of recent years, and the most effective work accomplished by the various State and inter-State commissions, has been to lay bare many of the secrets which have long been cherished as assets of value. As a matter of fact, have the secrets of operation, or of rates, been of such great value? If we discuss the question from the standpoint of the effect upon consumer, we would say decidedly "No." Now, if this informati n is to be given out is it not better that the companies furnish reliable information rather than be misrepresented through the medium of sensational journalism? Take, as an instance, the inquiry by the Public Service Commission of the First New York District, into the wholesale rates of the electric light companies. As might be comprehended there was nothing uncanny about these rates, but there certainly was justice in the commission's order that the terms of all discounts be published so that all who cared might avail themselves of them. It is true that the customers are really no better off than they were before, but the feeling that one's neighbor is receiving favors which are denied you no longer remains to exert its subtle influence to cause discontent. On the other hand, the information may leave them in the condition of the party who admitted after an affray that he was sore but satisfied. In association meetings, as in public affairs, there should exist a policy of frank publicity, and those who take it upon themselves to censure the printed matter which is distributed are doing more harm than good to the industry as a whole. Strange as it may seem, the

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papers presented at the October meeting of our Institute are appearing in the foreign gas papers, but none have seen the light of day in the JOURNAL during the month which has elapsed since the meeting, simply because the Committee in charge failed to "release" such papers for publication. It is to be hoped that companies will not be so reticent about giving out matter to their local news mongers, but rather set a standard of publicity which may serve as a spur to those in control of the Institute. Take the public into your confidence, let them know of your good work.

OBITUARY NOTE, WILLIAM HOPKINS YOUNG.—With great regret we are called upon to report the death of Mr. W. H. Young, who passed away suddenly, in his apartments in the Hotel Touraine, N. Y., the night of the first inst. Mr. Young was born in Poughkeepsie, N. Y., October 21, 1855, and his paternal grandfather (Henry Young) was the merchant prince of New York in the first quarter of the last century. Graduating from the Sheffield Scientific School, Yale College, he was subsequently admitted to the bar, and came to New York, where be became the junior member of the firm of Phinney & Young, which in time became noted for its transactions in the handling of estates. Later on, due to the causes that become effective in such tnstances, the firm at the present time is that of Young, Ver Planck, Prince & Flanders, which firm is well and favorably known in our Surrogate's Court and on the real estate exchange. Mr. Young was, some years ago, in conjunction with Mr. E. S. Atwater, the well-known Dutchess county banker, proprietor of the Poughkeepsie (N.Y.) Gas Light Co., of which corporation he was the active business man until the Young-Atwater interests were purchased by Mr. Wm. R. Beal. Deceased had, beneath a rather gruff manner, a most receptive heart, and, to the personal knowledge of the writer, many a worthy charity is traceable to him. He is survived by his widow, *nee* Miss Innis (whose father was one of the best known men in Dutchess county), a daughter and a son. The funeral services were held the afternoon of Saturday last, in his home on the Hudson hills; a place known as Locust Grove, justly celebrated for its beauty of location throughout the picturesque Dutchess-Putnam district.

OBITUARY NOTE, MR. GEORGE M. WITHERDEN.—The many friends, who have not heard, through other means or agency, of the sad fact that Mr. George M. Witherden, for many years intimately connected with the gas meter industry of America, has passed away, will now grieve with them. His death was the inevitable sequel to a prolonged illness that beset him some time over two years ago. Born in Biddenden, Kent county, England, June 3, 1853, early in life he accompanied his parents to this country. At the age of 19 he entered the service of the American Meter Company, where he mastered the trade. He remained with the Company until 1895, in which year he elected to accept a position with the Metric Metal Works, of Erie, Pa. He remained with that Company for quite a lengthy period, but, wishing to return to Philadelphia, with which city his associations and family relations as well were most closely identified, when the opportunity offered he returned there to accept a place on the force of John J. Griffin & Company. In the service of that Company he was when death claimed him. He was a man of quiet ways and worth, and will be sorely missed by those who were his intimates. We are indebted to Mr. John J. Gribbel for many of the facts connected with this short narrative.

RESIGNATION OF MR. EDWIN E. WITHERBY.—It will come to many as a surprise that Mr. Edwin E. Witherby saw fit to resign from the service of the Susquehanna Railway, Light and Power Company and of the Railways Equipment Company, Ltd., of this city, in the employment of which, and in that of its predecessors as well, Mr. Witherby had been for a lengthy period. At the time of his resignation the official title of Mr. Witherby was that of Vice-President, which post we deem it likely that Mr. Bullock, the Company's President, believes is not necessary while he is at the helm. However, be that as it may, a fact or two in respect of the Company's history may not be out of place, in that much of its success is due to the efforts of the gentleman whose resignation is herewith chronicled. When the Union Gas and Electric Company was merged with the United Gas and Electric Company—the former concern was chiefly created by the effort of Mr. Witherby—the latter was the holding Company up to 1906, when the Susquehanna Railway, Light and Power Company was formed, which took over the operation of the properties of the United Gas and Electric Company. Mr. Witherby was Chief Engineer and Assistant to the President of the Susquehanna organization for over a year, in fact, since the office of General Manager of the Susquehanna Railway, Light and Power Company was discontinued. Mr. Witherby was Vice-President of the Railways Equipment Company since its formation. The resignations became effective the 1st inst. Of course, and of necessity, changes are bound to occur in the official management of corporations of any and all sorts; but these changes are frequently not traceable to active, inciting cause for the entire benefit of the corporations affected thereby. However, we do not know why this change has occurred, nor is it in any sense necessary that we should. But we do believe it is incumbent upon us on this occasion, and at this time, to say that, whatever the inciting cause may have been for the action, it is nevertheless a broad, sturdy surety that no small, in fact, a goodly share of the present importance of the Companies concerned is directly traceable to the strong, maintained and judicious efforts put forth by Mr. Witherby, who, now that the structure seems solid enough to stand without further supporting effort from him, is virtually told that the limitation of his usefulness has been decreed.

CURRENT MENTION.—

AT a recent meeting of the Directors of the Grand Rapids (Mich.) Gas Company, the resignation of Miss Mary E. Kearney, as Treasurer of the Company, was accepted. Miss Kearney was elected Treasurer in 1903, having served the Company in other places of trust from the year she entered its service some years before. Her successor is Mr. John A. Hulswit.

THE Public Service Commission for the Second New York District has authorized the Northern Westchester Lighting Company, of Ossining, to issue $124,000 of bonds, to run for 45 years and to bear 5 per cent. interest.

THE Geist syndicate, in connection with its recent purchase of the Wilmington (Del.) Gas Company, announces that the net rate for gas during 1910 and 1911 will be 98 cents and 95 cents per 1,000, respectively.

THE residents of Millbury, Mass., have petitioned the Worcester Gas Company to extend its main system to and through that settlement. The place is about 4 miles distant from the Quinsigamond line, and has a populatiou of 2,200 or more. It has had an electric service for some years.

THE output of the Boston Consolidated Gas Company, for the 24 hours ended Tuesday, November 23d, amounted to 19,954,000 cubic feet. The prior high record was 19,333,000 cubic feet, January 12th, 1909.

THE authorities of Chehalis and Centralia, Wash., have granted a franchise for the operation of a gas works in the named places, to Mr. W. W. Seymour, of Tacoma, Wash.

THE proprietors of the Athol (Mass.) Gas and Electric Light Company have, after much clamor on the part of the residents, determined to keep up an electric service all day a nd all night.

MR. THOMAS U. FLANNER has resigned the position of Assistant Superintendent of the Battle Creek (Mich.) Gas Company, to accept the position of Manager of the La Porte (Ind.) Gas Company.

Book Reviews.

"*The Distribution of Gas.*"—By Mr. Walter Hole; John Allan & Co., London; 830 pages, 634 illustrations. Price $6.

The revised and enlarged second edition of this standard work is a credit to its author and an advertisement for its publishers. Seven chapters and 100 illustrations have been added to the original. The subjects covered are: "Fixing Meters;" "Pipes and Joints for Internal Fittings;" "Internal Fittin gs;" "Internal Lighting;" "Gas Fires, Cookers and Engines." The JOURNAL reviewed the first edition of this in detail, and to the former mention can only add that the second is likely to and certainly should find its way into the library of every gas engineer.

"*The Gas Engine.*"—By Mr. Forrest R. Jones; John Wiley & Sons, New York; 447 pages; 142 figures. Price $4.

A text book designed especially for students, covering the operation as well as the theory. The chapters on gas engine troubles should be of value to those operating engines, and if tests are to be made the method of so doing is clearly given. The cuts are well selected and described, and the calculations are worked out in detail.

Furniture Lights.

[Communicated by "R."]

They say that the practice of furnishing furniture lights had its inception through the efforts of persons who wished for night lights attached to bed posts that they might read themselves to sleep, and it is so that there are readers who never think of retiring without reading a novel or other book. Lamps and gas jets are furnished for this purpose by the manufacturers of chamber sets, and illuminating schemes for the night readers can be secured in many varieties from the manufacturers and designers of house illuminating fixtures, and there are patented lighting devices of the fireproof order for this service. In fact, a party who wants to read himself into slumberland can be provided with an abundance of excellent light for reading purposes. The designers and makers of household articles were not slow in applying the bedstead lights to table, hall stand, chair, sofa and other forms of the lighting of articles for room and hall, and some exceedingly attractive and ornamental gas fixtures may be found in use on all sorts of furniture. The idea involves the application of an attractive lighting combination with a piece of novel or useful furniture of the dining room, chamber, studio, spare hall, office or servants' quarters. In the latter some of the lamps are of plain design, but the lights are good. In the parlor and the library the lights are arranged so as to form part of the ornamentation of the surroundings as well as for lighting uses. The writing table is fixed with a type of lamp that showers the rays of light in varied hues over the writing pad.

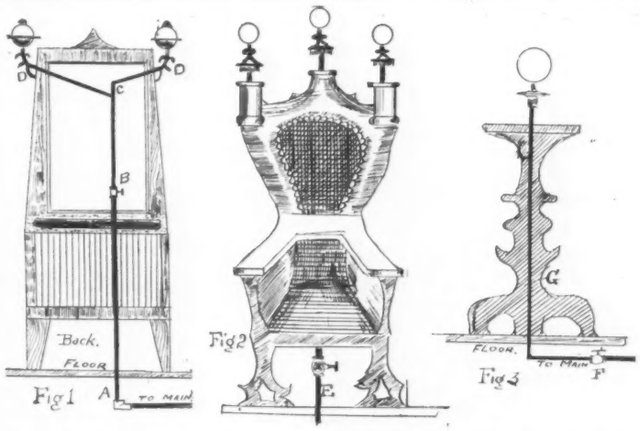
On the reading chair the lights are arranged so as to cast the rays to the pages of the book or newspaper. In the hallway, the object is to get a dull hue of appropriate color distributed over the scene with a blending effect with the original shades of the paper, trimmings or carpeting. There are places where certain articles of furniture are fixed with portable lighting apparatus. The chair for the porch may be fixed with the reading lamp, properly shaded, and the supply of gas secured through a flexible tube running along the platform to the chair from a tap in the gas main nearby. Lights for settees about the grounds of the estate can be lighted in like manner.

In Fig. 1 is shown the back of a hall stand. The pipes for conveying the supply of gas to the lights, at the sides *D*, *D*, extend along the rear of the stand, from the joint *C* to the controlling valve *B*, where the supply of gas is shut off or turned on as desired. From the valve cock the pipe reaches down through a hole in the floor to the gas main below, where a union is made. Hence when it is wished to light the hall stand, the valve cock is opened and the gas is ignited.

Sometimes exceptionally odd seats are selected for affixing lights in the home. The ancient types of furniture are often bought up for this use. An old, antique form of chair, like that in Fig. 2, may be arranged with reading lights above as illustrated. The supply of gas can be obtained from a connection in the wall or beneath the floor.

Instead of cutting through the floor or wall it is possible, in some instances, to get the supply of gas by extending a rubber tube direct from one of the fixture jets to the supply pipe of the article. In this case, the supply pipe *E* goes to the main below, and the gas is carried upwards to the joint of the three distributing pipes at the back of the seat. Then the pipes lead to the lamps and the required illumination results. In fixing the pipes to the articles of furniture, common capped bearings may be employed. Bushings and necessary leaders for the fixing of the pipes and unions can be obtained at any of the gas works or gas fixture establishments.

Certain articles of furniture cannot be furnished with an external line of piping for carrying the gas, since the exposed pipe would be out of harmony; therefore, the plan shown in Fig. 3 is used successfully, although it often requires considerable exertion to get the hole bored through the center of the stand correctly. There are effective drilling machines in use in furniture manufacturing plants on which it is possible to bore a straight hole for a gas pipe. Hence the latter can be run from the main to the connection *F*. Thence the pipe runs upwards through the hole in the middle of the stand along the line *G*. The next we see of the pipe is when the stub extends outward above the top of the table line. Then the desired description of lamp can be attached. Hence the appearance is that the pipe carrying the gas projects straight from the table center. Of course, this retains the table in the one place, except when the pipe is disconnected. An illuminated hat tree is always an attractive article for the hall.



An illuminated grandfather's clock is also pleasing to the eye when fitted with a number of illuminating contrivances. There are lights on desks employed with practical results as all know. Lights specially designed for the card table and the dining table always appeal to the housewife. The furniture men are working out some elaborate plans for colored lights in connection with banqueting tables. Tables for lunches and tables for pool or other games come in for certain forms of lights, all of which receive the attention of the specialists. Certain forms of lights are required for the man who engraves, also for the artist at the sketchboard. Quite a study in effective lighting of household and office furnishings has resulted from the modern demands upon illuminating gas engineers and mechanics.

[CONTINUED FROM PAGE 1197.]

REPORT OF PROCEEDINGS, FOURTH ANNUAL MEETING, AMERICAN GAS INSTITUTE.

HELD IN THE HALL OF ELKS, DETROIT, MICH., OCTOBER 20, 21 AND 22, 1909.

FIRST DAY—MORNING SESSION.

The President at this point requested the First Vice-President, Mr. Gartley, to take the Chair while he read his address.

The President then read his address as follows, at the conclusion of which there was great applause.

PRESIDENT'S ADDRESS.

It gives me great pleasure to greet you on this, our Fourth annual convention, or what is really the Thirty-seventh convention, if we go back to the organization of the oldest of the Associations which amalgamated to form the American Gas Institute.

We meet in a most beautiful and cordial city, convenient of access to our members, at a season when work is no hardship, and in a time of returning and assured business prosperity.

Our committees of the year have done a vast amount of work, some of which has already appeared in the JOURNAL.

Our Technical Committee has arranged a programme embarrassing in its lavishness, timely in its topics, and giving much food for thought to all classes of our membership, and our Committee of Arrangements has looked after our welfare and provided those opportunities for social intercourse which do so much to weld together the members of a body like this.

Possibly, if your officials had power to enforce their requests, and were catering to a body whose tastes were identical in all respects, we might have attained 100 per cent. efficiency, having each detail satisfactory to each member; but there is no power to enforce in a body so loosely held together as this, and the different classes of our members have their chief interests in different subjects. Besides this, much that we planned has failed of accomplishment through no lack of effort on our part, but we believe no one who participates in this meeting will regret his trip to Detroit.

Having in mind that matters of policy, commercialism, chemical, technical and mechanical matters and the progress of the business during the year are cared for in the programme, it seemed well for me to speak of some points in connection with the Institute, the industry and the programme, rather than to discuss one or more technical points.

The Institute.—The American Gas Institute, now assembled for its

4th annual meeting, comprises in its membership over 1,300 persons, representing an industry with an investment of over $1,000,000,000.

The members of this body are directly responsible for the safety of this vast amount of money, and are charged with the duty of employing it, not only to advantage, but to the best possible advantage.

We have upon us the burden of so caring for this property that it shall be conserved to its utmost, that its direct depreciation shall be the least possible, and that its expenditure in new or untried fields of policy, in process or apparatus, in business methods or devices, shall be so wisely forecast as to produce the maximum result with a minimum expenditure. It is no great task to produce results with lavish expenditure. True management goes farther than this.

We are expected to handle the property placed in our control so that the stockholder shall have a fair return upon his investment, but we are expected also by the public, while doing this, to make a fair price to them for our commodity, and we are responsible for the quality and reliability of supply of what once was a luxury but now is a necessity.

Truly, this is no light burden if done well, and as one of the means to this well doing, we meet here, the American Gas Institute, to consult, co-operate, interchange ideas, discuss methods of policy, of engineering or of salesmanship, or to take any other steps we may see fit, tending to the betterment of our industry or the property in our charge. Such step may be the passing of a measure defining some particular unit, it may be the formal setting forth of some new idea in policy, in manufacture, or in the sale of our product, or it may be the informal meeting and discussion of some matter of common interest by men from the extremes of the country with their naturally varying views and requirements.

It is difficult to say which is the more valuable, the formal or the informal, but we who organize clubs with pianos and pool tables, ball teams and athletic sports, to promote loyalty and helpful comradeship among our workmen, that the benefit may in some measure return to our own undertakings, we must not forget that we also are workmen in our field and should not ourselves neglect the social features we lay so much stress on for others.

In forming the American Gas Institute, three Associations of national character were merged into one. It is desirable that there should be no other Association national in character. It was to be expected that many smaller Associations, occupying special territory or devoted to special branches, should continue their Associations, or that new ones should be formed, and such proves to be the fact. In the place of 11 Associations existing at the time of the formation of the Institute, there are now 22. But the American Gas Institute should be the national body, the common meeting place, and the clearing house of the industry.

Wherever located, whether big or little, however owned or operated, we have three divisions of work common to all, which make necessary the co-operation and combination in the American Gas Institute of all workers in this industry for the protection and advancement of our business. They are: The establishment and maintenance of proper relations between ourselves, the authorities and the public; the production and distribution of our product and its sales; the business relations, the engineering or economic and the commercial, the manager, the engineer, the salesman.

The meetings of the past, in this body and its predecessors, have been largely dominated by the technical thought. The organizers of the Institute, however, recognized the necessity of dealing with matters of public policy, and in the proceedings leading up to its formation the necessity of work in this direction was recognized and enlarged upon. Although in the establishment of our committees the Public Relations Committee was first named and given great prominence, the records of our "Proceedings" show relatively little work done in this direction outside of the committee reports.

I believe this is in part due, as stated before, to our being accustomed to regard these meetings as technical meetings. Possibly also it is due in part to the fear that these matters, some of which are of a delicate nature, may not be handled with proper tact and skill; but there are in our relations to the public, to the law-making bodies and to the commissions, many matters about which we should go on record before the public, and many matters in which we should use our influence properly, that our properties should have fair treatment.

If we do not take up this work some other national body will in time, and it would seem that the duties of the Public Relations Committee should be expanded to the extent of procuring for our programme several papers dealing with these subjects each year.

On commercialism we have no committees, and have done but little work, yet increased profits are largely obtained through development of business, and the object of commercialism is to develop the business. So little has been done that an organization has been formed, national in character, to cover this ground. That so little had been done is apparently due to the faet that many of our members did not realize the importance of this branch of our work. The importance has been made plain to us and the progress of this natural sub-division of our work should be before us each year as part of our programme.

While it is of great value for our new business men, our salesmen and our demonstrators to meet the appliance man, the appliance man also wants to meet the manager, for it is to him commercial schemes must be presented for discussion and approval. There is no better place than at this meeting of the national body, of the controlling minds of the companies.

Steps are being taken towards some form of amalgamation wit the Commercial Association, and for the general good of our business, I trust you will give it your careful attention, and if necessary concede minor matters for the greater good of all.

While we have a large membership, we represent a much smaller number of companies, there being, as I roughly count them, some 425 companies represented in the Institute. Representatives of relatively few of these companies take an active part in the proceedings.

Your President of last year made the startling statement that, during a period of 12 years, about 50 per cent. of the papers had been contributed by representatives of two powerful interests.

It is natural that powerful interests should absorb a large percentage of the high grade men, as they naturally should offer better opportunities for advancement, and it is natural that men of these attainments should be the most ready contributors. Moreover, if such concerns are interested in the Institute, they can insist that their men should work for it, but an extreme showing such as is cited is undesirable. Powerful interests of this nature must necessarily be subject to a system which tends to give uniformity of results, and our papers, if coming from but one or two sources, might lack that element of originality which comes from independent effort. Too much inbreeding means disaster in the end, and if we can obtain our contributions only from a limited source, it means that some portion of our method is at fault.

There are in this broad country so many men handling large and small plants engrossed in problems having a greater or less bearing on our common work, there are so many things that everyone here can learn of policy, economy, or salesmanship from the representative of the smallest company on our list, that, unless we draw them out formally and socially, we are cultivating but a portion of our field and not doing our best work. Your President of last year said that we need and must draw out new blood. That sentiment I heartily indorse.

We have made special effort this year not to discourage work from the powerful interests, but to encourage others and to broaden the the field of contributors. We think to a considerable extent we have been successful. It is plainly apparent, however, that there is not that productive loyalty to the Institute, nor was there that productive loyalty to its predecessor, the American Gas Light Association, that existed in the Western, the Ohio and other Associations.

As far as I can ascertain by inquiry, one reason for this lack of loyal and hearty support is that many members have lost interest or do not become interested, because they feel that they have little or no representation, that the course is predetermined and shaped regardless to them, and often in spite of them. If this is true, and they do not resent it, the word "American" has no place in the name of this body. On the other hand, as Dr. Humphreys said in his address last year in discussing this subject, "Where so much is contributed, those who contribute should be influential in determining the Institute's policy and procedure."

If this is a concise statement of the two views, there appears to be no good reason why conflict should exist, if a reasonable amount of tact and a liberal application of that good, old-fashioned nerve tonic called the Golden Rule were used.

In the development of a business like ours it is necessary to present a harmonious and united front, and if we are to do our best work no portion of our membership can do without the other.

Some of the best and most valuable improvements in apparatus and methods are coming and have come from sources entirely independent of the large organizations. On the other hand, the systematic training of the men in these organizations does much to promote continuous and progressive work along defined lines.

The Industry.—It is not unusual to find the statement from our

competitors, and sometimes from our friends, that our business has reached its maximum. The contrary is true, and we may well congratulate ourselves on the condition of our industry.

The returns of the Geological Survey show the increase of manufactured gas sold in 1908 over 1907 to be over 5 per cent., and this in spite of the prevailing depression in business during that year.

It is to be regretted that previous to 1907 these records were not made in sufficient detail to carry the comparison further back; but, taking the returns of the Board of Gas and Electric Light Commissioners, of Massachusetts, which are most carefully and accurately compiled, it will be found that the gas sold in Massachusetts in 1908 was 10,770,000,000, and in 1898 was 5,650,000,000, an increase of 90 per cent. in 10 years. There was received by the companies in 1908 $10,433,307, in 1898, $6,214,387, in spite of the fact that the average selling price in 1908 was 20 cents lower than in 1898, and the additional fact that over $10,000,000 was paid for electricity in 1908.

A comparison of the sales of gas in a number of the large cities and towns shows an enormous rate of increase. Ten, 15 and even 20 per cent. increase per annum is not at all unusual. Cities can be found where the output of gas has doubled every 6 or 7 years for a number of times, and instances are known of the business doubling in even a shorter time.

There is much said about the decrease of sales due to electric competition. Is it not an ally rather than a competitor? It has done much to educate the public to the use of more light and we have reaped the benefit of it. Together we are working out the problem of illumination. In the old times we built fires to warm ourselves. We had no thought of heating the entire house. So a few years ago we used light to enable us to see some special object. Now we aim to illuminate the entire space, and in this work we have the aid of electricity.

In the company which I represent we have a combined gas and electric plant, the revenue from each being substantially the same. The electric business has been established some 20 years. Our city has no features which differ from those of the average city, and we aim to give to each customer what he wants, if he knows; and if he does not, we advise him to use what we believe will give him the greatest satisfaction, everything considered. Under such circumstances perhaps the rate of growth will be an indication whether or not we have need to worry about the inroads electricity may make on our revenue.

Leaving out the first 10 years, when electricity was undeveloped, the rate of the past 10 years is as follows:

Year.	Gas Sales, per Capita.	Electric Sales, per Capita.
1899	$2.44	$2.35
1900	2.59	2.26
1901	2.84	2.37
1902	3.16	2.42
1903	3.51	2 62
1904	3.61	2.95
1905	3.85	3.07
1906	4.18	3.56
1907	4.33	3.87
1908	4.43	3.75

An increase of gas sales in the 10 years of 81 per cent. and in electric sales of 59 per cent. It will thus be seen that the sale of gas per capita has, for these 10 years at least, outstripped the electric sales per capita. The price of each has been steadily decreased.

That there is still opportunity for growth in our business is indicated by the data given, and the fact that, although we have a population in this country estimated at 90 millions, according to the best available returns only about 36 millions are now served with gas, and there are only about 5 millions customers reported by the companies. This gives a sale per meter of about $26, and a sale per capita of about 4,300. Still beyond this, we have the growth of business which should come from the natural increase of population, which amounts to 2 or 3 per cent. a year. It would thus appear that, contrary to the often heard rumor, the business is rapidly growing and the field is far from being fully occupied.

We occasionally hear that the water trust is absorbing all the water powers of the country, and that the fast approaching failure of the coal supply will make us dependent upon them for our light and heat. The just published reports of the Government Geological expert, however, estimate that but 4/10 of 1 per cent. of the original supply of coal has been exhausted.

In general it may be said that our business relations with the public and the authorities are becoming better. Matters not well understood are becoming better defined, and the attitude of the public is improving as the conditions under which the companies operate are better understood through greater publicity, and there is decidedly less municipal agitation.

There have come up during the year several matters affecting our relations with the public. In the New York rate case, confirmed by the Knoxville water case, and later in the Cedar Rapids case, there appears to have been established the right of the government to regulate rates, from which there is no appeal, unless by actual trial such rates have been demonstrated to have been so low as to be confiscatory, and the United States Supreme Court has indicated that, in these cases at least, the company is entitled to receive at least 6 per cent. on its property above all proper charges.

In the New York case the Court has allowed, as a portion of the Company's property, a valuation for franchise, and in discussing this point implies that if a State taxes a franchise it must allow the Company to collect from the ratepayers the interest upon it.

The Court maintains that the attempt by law to require certain pressures was unconstitutional, because it could be accomplished only at great expense, and it permitted the valuation of the company's plant to be based on reproductive value, which admitted the value due to increase on land and other property.

The new Federal Corporation Tax, which will go into effect on June 30, 1910, unless found unconstitutional by the Courts, affects all our companies. It imposes a tax of 1 per cent. per annum upon the net income of the company above $5,000.

From the gross income can be deducted, beside the $5,000, the necessary expenses of the maintenance and operation, including rental and franchise payments, all losses not compensated for by insurance, reasonable depreciation, interest on an amount not exceeding the paid in capital stock, taxes and dividends received from other corporations subject to this tax.

If a company, for instance, is capitalized at $6 per 1,000 sold, and earning 6 per cent. on its capital, the tax would be about ⅓ of a cent per 1,000 sold.

In Massachusetts the sulphur allowance has been raised from 20 grains per 100 cubic feet to 30 grains per 100 cubic feet, subject to farther regulation by the Board of Gas and Electric Light Commissioners, if deemed necessary.

I do not know why the decrease of our selling price cannot be taken as a measure of successful progress in solving the technical and engineering problems which must be solved to reach economical production.

It was not many years ago that a President of the American Association, in an address, devoted considerable time to a demonstration that gas could be produced and sold for $1 per 1,000, but gas is now being sold at much less than that in many large and medium size cities of the country.

As a measure of that progress, and as probably representing the rate of decrease in the price throughout the country, it will be found that in Massachusetts the price of gas was in 1887, $1.62, in 1897, $1.15 and in 1907, 95 cents. Taking 10 of the large cities of this country, it is found that prices for gas are 20 per cent. lower than 15 years ago.

Regarding our selling price, the impression is general in the public mind that prices are lower in Great Britain than in this country, and that we should be able to sell gas here as low as it is sold there. In the recently published reports of the U. S. Geological Survey, it is stated that, during the year 1908, 156,909,310,000 cubic feet of artificial gas was sold in the United States for $133,511,122, or an average price of 85 cents.

It was difficult for me to find corresponding data for Great Britain. In "Field's Analysis" the average selling price of 37 companies of large size is about 62 cents. The Board of Trade, in their recent report, state that in the United Kingdom there was 172,889,147,000 cubic feet of gas sold by 771 companies, and the receipts were $146,129,275, or an average price of 84½ cents per 1,000, but it is probable that the receipts as usual contained other things than gas, so the average price of gas may be lower.

I find in the *Journal of Gas Lighting* a statement, by Mr. E. J. Slinn, Chairman of the Watford Company, "That there are something like 1,250 gas undertakings in England and Wales, and the average price of gas is 4 shillings (or 97 cents). The Lnodon price was 2s. 9d. (or 67 cents)."

In our attempt to reach low prices we have, however, at the present time, one serious handicap. There is invested in the United States over one billion dollars in gas properties, or a capital of at least $6.37 per 1,000 sold. The English Board of Trade returns show $3.26 capital per 1,000 sold. This excess of capital per 1,000 is undoubtedly

largely due to the higher cost of labor which enters so largely into the cost of all material and construction.

If 6 per cent. is a fair return on the investment, in either case, our selling price would necessarily be 18 cents higher, but this is not all, for if our capital is doubled, our taxes are increased several cents per 1,000, which must go into the charge for gas.

Probably this larger capital per 1,000 is made necessary in part by our less densely populated cities and our smaller sales per capita. A large number of selected cities in the United States gave an average sales per capita of 5,534 feet. The same number of cities of the same population in Great Britain gave a sales per capita of 8,737 cubic feet or about 60 per cent. more.

If our engineers can produce a larger amount of gas per dollar expended on plant, and our commereial men can bring about a greater sales per mile of main and per capita sufficient to reduce our capital per 1,000 to the English basis, the principal obstacle to prices equal to the lowest in Great Britain will be removed.

That we are making great progress in sales per capita is shown by the fact that 30 large and small cities taken at random in the United States show an increase in 20 years of from 1,500 to 4,500 per capita.

The Programme.—We have endeavored in our programme to make it broad in character and to deal with live matters. "The Progress of the Industry," "Matters of Public Policy," "Illuminating Engineering," "Chemistry," "Oil and Oil Gas," "Details of Plant and Apparatus," "Retort House Results," "Residuals," and several on "Commercialism." Two of these interest me greatly.

A new field has been opened these past few years for the use of one of our residuals, in the brushing, painting or sprinkling of our roads with tar. The traction effect of the automobile is totally different from that of the horse-drawn vehicle, and roads which have stood the test of time and wear under the latter fail quickly under the former traffic.

Particularly is this true if the usual method of keeping down dust, that of water, be employed. Each slight depression collects some of the water sprinkled upon it and remains wet longer than the slight elevations, with the result that in the depression the surface of the road is softer than elsewhere. The scouring action of the automobile wheel enlarges this depression. The watering and scouring are repeated till the road surface is worn into a multitude of little holes and the road requires resurfacing. Water is about the worst thing that can be used upon roads of the present day. Something which will shed, not absorb, water, is needed, that the softening action alluded to shall be avoided.

Oil, directly and in emulsion, is used with some success, but it has no binding action upon the road surface, and often in wet weather becomes mixed with the road dust into a paste very disagreeable to pass over.

In tar we have both the binding and the water resisting action. It has been used with great success, not only on the surface but for binding together the first few inches below this, and I believe there will be developed a large market for our tar in this direction. When in one small State alone 20 millions dollars worth of automobiles are engaged in wearing out roads, the extent of such a market is apparent. The matter will be fully dealt with in a paper and discussed by those who have given it careful study.

A most tantalizing will o'-the-wisp has danced before our eyes for a number of years. Rumors of yields and candle feet never dreamed of before have incited a few, mostly in New England, I believe, to redouble their efforts, to inquire and experiment on the proper weight of charge, proper duration of charge, question of temperatures, and condition of gas in retort, mouthpiece, standpipe, hydraulic and take-off main. In fact, condensation beginning at the retort rather than at the point where writers on condensation usually begin.

A possible saving of rising 3 cents per 1,000 on cost of gas in the holder, while not equal to the saving to be had by the adoption of verticals, inclines or horizontals with machinery, is, with this exception, the largest possible saving in coal gas manufacture presented for our consideration for some time and therefore worthy of considerable attention.

In 20-foot horizontals with charging machinery, and 18-foot inclines, the ordinary yield of 80-candle feet from standard gas coal was easily pushed up to 85-candle feet and held there; at times for considerable periods 90 feet were obtained; under special circumstances 95-candle feet would be reached; and once or twice 100-candle feet were obtained; but, like the cup of Tantalus, it was gone before we could enjoy its blessing.

That it is possible to produce 100-candle feet, or about 6 feet of about 17-candle gas per pound of standard gas coal, has been, however, demonstrated beyond question by mo nths of continuous operation in a works managed by one of the most competent and conservative members of this Institute. These results will be presented for your consideration during the meeting.

No more important economic matter has been recently brought before you, and I trust it will receive your closest attention. It is within the memory of many of us that a good-natured rivalry, as to yield per pound among some New England men years ago, ran the yield well up towards 6 feet per pound. Candle power was lost, however, and made up by the cheap oils then in the market. This yield was produced simply by increased heats, but the furnaces were of the old type, small in capacity, clinkered often, and, while the average temperature by great exertion was maintained, yet the maximum and minimum temperatures were far apart.

From my own experiments and observation I am of the opinion that, while the filling of the retort, the duration of the charge, the the variation of standard coals, the proper handling of the generated gas, the character of the material of the retort, the style of retort, whether vertical, inclined or horizontal, are all points to be cared for; they are minor points, though, and the main thin g is to apply a continuous, steady, even heat, probably not over 200° higher than our good type furnaces yield us now. And this can be done readily if non-clinkering furnaces of sufficient capacity are installed; but such results can not be produced by the ordinary furnace, since, while its average temperature may be high enough, its maximum is too high, breaking up valuable compounds, while its minimum is not sufficiently high to produce the desired result.

The programme is perhaps more crowded than it should have been, but it will give us a chance to make a trial of the sectional meeting plan, which has been recommended by committees of the past.

We have arranged for the two halls of this building and are to hold some sessions in parallel. There are objections to this we know. The halls are not equally spacious, and it is difficult to divide our work so as not to have some conflict; but the working time is barely 12 hours and either material must be cut out or so slurred over as to deprive it of its usefulness. Even with the double session, it will be necessary to closely abstract the papers and to concentrate ourselves upon the work. It is hoped not to restrict the discussions.

During the past year five of our members have passed from among us.

F. R. Persons, an active member; died August 1, 1909.
C. A. Knight, an active member; died August 14, 1909.
O. P. Moon, an associate member; died October 26, 1908.
C. H. Jacobs, an associate member; died March 15, 1909.
D. A. Gildersleeve, an associate member; died July, 30, 1909.

All were men we were glad to have with us and whose loss we shall feel.

Few among us are able to do what "Fred." Persons did for this and other Associations. Genial, always loyal, a host in himself, an untiring worker, he devoted his every moment at the meetings to doing those countless things, large and small, which do so much to make the routine work of our sessions move smoothly along. His was the self-sacrificing spirit which sank personal matters for the good of the cause. His friends will long cherish his memory.

The Chairman—It is customary to refer the President's Address to a committee, who will later report to the general body. Presuming that such is your intention, and without waiting for a motion to be made to that effect, I will appoint as the

COMMITTEE ON PRESIDENT'S ADDRESS

Messrs. E. C. Jones, A. M. Barnes, C. C. Simpson.

The President—The next thing on our list is the

REPORT OF THE NOMINATING COMMITTEE,

which is usually preceded by the appointment of Tellers. I would ask that Messrs. Geo. G. Ramsdell, W. R. Addicks and A. L. Wilkinson act as such.

Mr. W. W. Randolph, acting for the Nominating Committee, submitted the following report:

Mr. President and Gentlemen—Your Committee, appointed to nominate officers for the ensuing year, beg leave to report that, after due consideration, they unanimously nominate the following gentlemen:

For President.—Wm. H. Bradley, New York.
For First Vice-President.—R. B. Brown, Milwaukee.
For Second Vice-President.—J. C. D. Clark, Chicago.

For Secretary and Treasurer.—A. B. Beadle, New York.

For Directors.—Donald McDonald, Louisville, Ky.; I. C. Copley, Aurora, Ills.; J. B. Klumpp, Philadelphia, Pa.; John A. Britton, San Francisco, Cal.; Richard C. Congdon, Atlanta, Ga.

Respectfully submitted, W. W. Randolph, E. G. Pratt, R. M. Searle, T. R. Beal, W. F. Hart, } Committee.

ELECTION OF OFFICERS.

The President—What action shall be taken on the report of the Nominating Committee? Unless there is objection to the report, a ballot is in order at once.

Mr. Williamson—I move that the Secretary cast the ballot of the Association for the names recommended by the Nominating Committee. [Seconded and carried.]

The Secretary—Mr. President, I cast the ballot of the Association for the parties named in the Nominating Committee's report.

The President—Is Mr. Ramsdell present? [No response.] Mr. Addicks, will you act as Chairman of the Tellers, and state the result of the ballot?

Mr. W. R. Addicks—I report that all the votes have been cast in favor of the nominees as read by the Chairman.

The President—It gives me pleasure to announce that the gentlemen nominated have been elected. I have no doubt you would all be very glad to hear from Mr. Bradley.

SOME RESPONSES.

Mr. Bradley—Mr. President and fellow members of the American Gas Institute. Several hundred miles of traveling on a sleeping car without much sleep is not conducive to speech making, but I wish to say that I thoroughly and heartily appreciate the honor you have conferred upon me. It is an honor to preside over an institution like ours (an institution which, by reason of its technical and scientific work, has achieved not only a national but an international reputation) composed as it is of the best type of American manhood, its members being those who think, act and work. The papers that will be read, and the discussions that will follow, are of more interest to you than any remarks I might make. In conclusion, I will signify my acceptance of the office by saying that I will endeavor, to the best of my ability, to maintain the standard of excellence of the Institute on the high plane where it has been placed by the gentlemen who preceded me. In doing this I shall ask the assistance of all the members, as well as the officers, and together we may succeed in advancing that standard beyond the position it now occupies. The pace has been set for us and the course is open. Let us see that we come to the meeting of 1910 with a record of substantial progress in all relating to the good of the Institute and its members. [Great applause.]

The President—Gentlemen, it gives me great pleasure to introduce Mr. Brown—although he needs no introduction—and I want to say to you that the success of this meeting is very largely due to his efforts.

Mr. R. B. Brown—Mr. President and fellow members: I can only say that I highly appreciate the honor which you have extended to me. I shall do everything that lies within my power to second the efforts of President Bradley to keep the Institute going, if possible, at a better gait than it has gone in the past. I thank you. [Applause.]

There were cries of Clark, Clark, to which there was no response.

The President—According to our Constitution and By-Laws the Committee on Place of Next Meeting should be announced at this time. However, it is customary for the presiding officer to confer with the incoming President, and, with your consent, we will delay that report until he has time to express his views upon that subject. The next thing on our programme is the report of the

COMMITTEE ON PUBLIC RELATIONS,

Mr. Lathrop being chairman thereof.

Mr. Lathrop—The report of the Committee is rather short. We have had a few meetings during the past year, but nothing of particular moment has been done. The report is as follows:

To the Board of Directors, the American Gas Institute, New York—Gentlemen: This Committee has considered several matters during the past year bearing on public affairs, but its work has not been of such a nature that a detailed report is necessary.

One very important matter (standards—quality, pressure, etc.) has been under discussion, but data with which to work was received so late that nothing has been accomplished regarding it, and we recommend that it be taken up by the Committee to be appointed for the coming year. Yours truly, A. P. Lathrop, J. L. Richards, E. G. Cowdery, W. R. Addicks, C. H. Dickey, Walton Clark, } Committee.

The President—What action will be taken on the Report of the Committee on Public Relations?

On motion the report was ordered accepted.

The President—Next is the

REPORT OF THE TECHNICAL COMMITTEE,

Mr. R. B. Brown, Chairman.

Mr. R. B. Brown—Mr. President and Gentlemen: On behalf of the Technical Committee I will simply say that we have presented the list of papers which you find upon your programme to the Board for acceptance, and we have a number of sub-committee reports to which we should like to call your attention, all of which will be presented by the respective Chairmen of the committees. [On motion the report was ordered accepted.]

The President—We will now take up the

REPORT OF COMMITTEE ON ELECTROLYSIS.

Mr. Brown—The report of the Committee on Electrolysis was submitted by Mr. Glasgow, Chairman, to Mr. Alfred E. Forstall, for reading. We just hear that Mr. Forstall has not arrived, so I will ask the President to introduce Prof. Ganz, of Stevens Institute, who has acted as Consulting Engineer for this Committee. He will read the report.

The President—Gentlemen, it gives me great pleasure to introduce to you Prof. Ganz, whom I think you all know.

Prof. Ganz—Mr. President and Members of the American Gas Institute: At the request of the Committee on Electrolysis I have prepared a few notes, which I will abstract, because I understand that the time is limited. Two years ago I had the pleasure of delivering a lecture before the members of the Institute on the "Methods of Conducting an Electrolysis Survey." I have had considerable experience since that time in applying these methods, and find that, while the methods, as given in my previous lecture, had to be extended to meet special cases, particularly where it was necessary to determine which one of a number of current sources was affecting a given piping system, outside thereof the general methods, as outlined in my previous paper, cover the ground pretty well, and I will not at this time enter into the study of measurements at all. I expect in this brief paper to deal with methods for protecting pipe lines from electrolysis, and the methods that may be applied can be grouped into two classes, the first class consisting of the introduction into the piping system of insulating pipe joints, so as to break up the electrical continuity of the piping system, the second method consisting in insulating the pipe from the ground. In order to get all the information available on these points for the paper, with the authorization of the Committee, I addressed a circular letter and a question blank to each member of the Gas Institute about 6 months ago, and I have received something like 200 replies. Many of the replies did not contain the information I really wanted, and in such cases I addressed a further question blank to the members, and in that way, by following up, I have the experiences from about 60 piping systems scattered all over the country. The data contained in these replies to my question blank have been abstracted, and these abstracts of the replies are given in an appendix to the paper. Names and locations are omitted, the abstracts referring merely to numbers, No. 1, No. 2, and so on. The paper proper, with special introduction by the Committee, is as follows:

To the Chairman of the Technical Committee, American Gas Institute—Sir: The Committee on Electrolysis beg leave to report that they have arranged for their Consulting Electrical Engineer, Prof. Albert F. Ganz, to present to the American Gas Institute at their next meeting a memorandum on

"THE PROTECTION OF UNDERGROUND PIPES FROM ELECTROYSIS,"

designed to round up, as far as practicable, the views and work of your Committee.

The chief obstacle to effective progress which continues to face your Committee is the very reasonable objection, on the part of the various interests concerned, to making public the results of important current investigations; owing, in the first place, to the fact that present conclusions are of necessity of a more or less tentative character;

secondly, to the fact that the present phases of these specific investigations are invariably of a confidential and generally delicate local character. These considerations have largely hampered Prof. Ganz in the preparation of his present memorandum, and have made it impossible for the Committee to secure other communications which they had anticipated would be at their disposal by this time.

Your Committee further beg leave to submit their opinion that no useful purpose will now be served by the continuance of a Standard Committee on Electrolysis. They consider it preferable, for the present at any rate, that the General Technical Committee should, as the opportunity offers, obtain communications from experts who are at the moment especially qualified to instruct or guide the members in some particular line of this work.

We, therefore, jointly and severally tender our resignations, together with our best thanks for the confidence that has been reposed in us. Respectfully submitted,

JOHN WILLIAMSON,
S. P. CURTIS,
ARTHUR H. HALL,
ALFRED E. FORSTALL,
J. D. SHATTUCK,
A. G. GLASGOW,
} Committee.

At the annual meeting of the Institute 2 years ago, I presented a brief paper in which general methods of making tests for stray electric currents on underground piping systems were discussed. Since then I have had considerable opportunity to use the methods described. While it has been found necessary to extend these methods, and also to use a number of special methods to meet particular cases, especially for the purpose of identifying sources of stray current, the general plan outlined in my previous paper is sufficiently complete for ordinary requirements. I will, therefore, not discuss methods of testing in this paper, unless some member desires to ask questions on this point, in which case I will be very glad to answer.

I will consider measures for the protection of underground pipe lines from electrolytic corrosion where they are found to be endangered by stray railway currents. The natural solution is, of course, to remove the cause of the danger; that is, to get the railway companies to take care of their own currents. This is completely accomplished by the use of an insulated return circuit. Even without this, I believe that, in almost every case where serious stray railway currents are found flowing on underground structures, it is possible to reduce such currents to small, oftentimes to negligible, amounts by proper track bonding and by the installation of properly proportioned return feeders, with the addition in some cases of negative boosters. The possibilities which can be accomplished in this direction have only recently been appreciated in this country by railroad engineers. An excellent investigation of this subject is presented by Mr. George I. Rhodes, in a paper entitled "Some Theoretical Notes on the Reduction of Earth Currents from Electric Railway Systems by Means of Negative Feeders," published in the Transactions of the American Institute of Electrical Engineers for 1907. This investigation clearly brings out the great reduction of stray currents which can be accomplished by insulating the negative busbar at the power station, and running out properly proportioned insulated return feeders to various points in the track network. This is in fact the plan which has already been very successfully carried out in Europe, and which was described in the Report of the Committee on Electrolysis presented to the Institute in 1906. I am informed on excellent authority that in two American cities the insulation of properly proportioned radiating return feeders, as referred to above, has reduced the stray currents on the piping systems to less than one-tenth of its former value. In some cases, where a road owns its own private right of way, it is perfectly practicable to substantially insulate the rail return circuit and thus eliminate serious stray currents.

If the underground piping system is a continuous electrical conductor of low resistance, and is affected only by currents from known sources, then it may be protected by metallically connecting it to the negative return circuit of each source. Such a bonding method, however, greatly increases the current flow on the system and produces other dangers, as, for instance, at a high resistance point, which may develop in a joint; here the current may shunt around such a high resistance point and produce corrosion. The greatest objection, however, lies in the danger that such a bonded system constitutes to all other underground metal systems. If we connect one piping system to the negative busbar we render it highly negative to all other underground metallic structures and induce current to flow to this piping system, thereby increasing the electrolytic dangers to other systems and producing also other dangers, such as fire hazard from sparks or arcs. Such a bonded piping system becomes, in fact, a part of the trolley return circuit, and the owner becomes a party to any damage that may result in the other underground systems. I have myself found various cases where actual danger and damage were caused to one underground system by the bonding of a second system. I know of one case where a large piping system was bonded to the negative return circuit of the railway by heavy copper cables in order to protect it from electrolysis. Serious trouble arose, however, from arcs produced by the large currents carried on the pipes, and explosions and fires resulted, in one case also severely burning a mechanic who was making repairs to the pipes. After two years of trial all bonds were removed, as the dangers produced by them were considered more serious than the possible protection from electrolysis afforded. I firmly believe that only such methods should be used which substantially prevent stray currents from flowing to and from the underground structures.

In regard to means which can be applied to piping systems to rid them from stray railway currents, there are two possibilities to be considered, and which have been tried, namely, insulating pipe joints and insulating pipe coverings. I have had some experience with and have made some tests in regard to each one of these methods. In order, however, to collect the experience from as many sources as possible, I addressed a circular letter and question blank several months ago to each member of the Institute, with the authorization of the Committee on Electrolysis, asking for his experience especially with reference to the above means for the protection of pipe lines.

In all 1,308 question blanks were sent out and 138 replies were received. Of these, 74 do not give any useful information, while the remaining 64 replies answer some or all of the questions, or give other definite information. I have made a careful study of the replies as received and, where the answere given did not enable me to get all of the information desired, I have endeavored to get this by further correspondence. A number of the members were good enough to furnish me with copies of electrolysis surveys made upon their systems, and I have also studied these in connection with the answers furnished. In this way I have collected the experiences from about 60 piping systems located in 32 different States scattered all over the United States. I have prepared extracts giving the important facts of such answers as describe characteristic conditions, and these are tabulated in an Appendix under three headings: "Experience with Cement Joints," "Experience with Insulating Joints," and "Experience with Insulating Coverings." The replies are arbitrarily numbered, and the extracts refer to these numbers, no names or localities being given.

Discussion of Experiences with Cement Joints.—Thirty-nine replies report experiences with cement jointed mains in the vicinity of electric trolley roads. Thirteen of these replies state that no trouble whatever from electrolysis has been found. In most of these cases, however, no actual tests have been made, the statement being merely based on general experience. Seven replies report some electrolytic corrosion of the cast iron mains; one of these reports corrosion at joints and the complete destruction of the structure of the cast iron. One other reply reports signs of pittings near the joints at a number of points. In 20 replies the electrolytic destruction of service pipes from cement jointed mains is reported, and in some of these cases this trouble is said to be very severe.

I have examined two systems in which services from cement jointed mains have been destroyed. It was found that the destruction had been caused by electrolysis from stray railway currents, and that these currents had reached the gas service pipes from the water mains through house service connections. That is, current was found entering by the water service pipe from the water main, reaching the gas service through the house piping, and leaving the gas service pipe through ground to return to the railway tracks, producing corresponding electrolytic destruction of the gas service pipe. Tests also showed that the water main, which was laid with lead joints, in these instances, was carrying large stray railway current, while no measurable current could be found flowing on the cement jointed gas mains.

I want to report one case of damage relating to a lead jointed gas main, where current was also found entering a building from the water main through a water service pipe, and leaving the building through the gas service pipe. The existence of this current on the gas service pipe was discovered when a meter was to be replaced, by the production of a severe arc when the gas service pipe was disconnected. An examination showed that current entered by the water service pipe and reached the gas service pipe through contacts with a

metal ceiling. This current was very large, reaching maximum values of 16 amperes. This condition was found in a district where the gas piping is highly negative to the railway return conductors, the current from the gas service flowing to the gas main, passing along the gas main to leave it at some other point. Electrical tests indicated that the water piping system was in metallic contact with the railway return conductors. This is an example of a distinct fire hazard produced by stray railway current entering and leaving a building through service pipes, and I have found similar cases elsewhere. This same dangerous condition is in fact likely to occur wherever services from two piping systems enter a building, of which one system is bonded to the return circuit of the electric railway.

In order to obtain the approximate electrical resistance of cement joints, I have measured the resistance of a large number of joints on different sizes of mains in actual use. The resistance values found vary from a fraction of an ohm to several hundred ohms, the majority of joints showing high resistance values.

Two cement joints on 8-inch cast iron pipes were also subjected to tests in the laboratory of Stevens Institute. These joints were tested for resistance after having been made up for several months with currents varying from 0.02 ampere to 5 amperes. One of these joints showed a practically constant resistance of about 40 ohms. The second joint showed a variable resistance for different current strengths; with 0.02 ampere the resistance was 28 ohms, with 1 ampere it was 4 ohms, and with 5 amperes it was only 0.7 ohm. This phenomena of variable resistance with different currents is characteristic of imperfect contacts. It is therefore likely that in the cement joint showing the variable resistance the end of the spigot is in mechanical contact with the interior of the bell, but forming an imperfect electrical contact, while in the first joint showing a constant resistance the end of the spigot and the interior of the bell are out of contact altogether. Six additional cement joints on 8-inch cast iron pipes were also subjected to laboratory tests after having been made up for about a month. Three of these joints showed low resistances, varying from 0.01 to 0.05 ohm, while the remaining three joints showed resistances varying from 5 to 10 ohms. Each of these 6 joints showed some variation in resistance for different current strengths, but these variations were not large. It appears that in the three joints showing low resistance the pipes must be in metallic contact, while in the three joints showing high resistance there is no metallic contact. It is probable that the resistance of these cement joints will increase with age. All of the cement joints tested, except those which show such low resistance values as would indicate metallic contact, showed a polarization voltage varying from 1.5 volts immediately after the current was removed to about 0.1 volt after 24 hours; this means that a voltmeter connected across one of these joints gives an indication after the current had been interrupted. While this polarization voltage cannot produce any substantial current flow, its existence is nevertheless significant and may give rise to misleading conclusions from tests upon cement jointed mains. As an example of this I would cite an experience which I had a year ago. On a cement jointed main no readable deflection could be obtained on a sensitive millivoltmeter in 11 feet of continuous pipe. Across one cement joint a potential difference of 0.22 volt was indicated, however, and across the adjacent cement joint a potential difference of 0.13 volt, while across both joints the potential difference was nearly 0.4 volt. The measurement of the potential difference over 750 feet of this main, including about 60 cement joints, gave a value of 0.5 volt; but an ammeter connected across these two points by copper wires did not indicate any measurable current. It is, therefore, clear that this main, although showing substantial potential differences across individual joints, was not carrying any measurable electric current.

So far as being effective in breaking up the electrical continuity of a pipe line laid with all cement joints, it does not matter whether the joints have a resistance of a few ohms or of thousands of ohms; considering that the resistance of cast iron pipe is only a few hundred-thousandths of an ohm per foot of length, it will be seen that, compared with the pipe itself, the resistance of a cement joint is generally so high that it may be classed with insulating joints. It follows, therefore, that a pipe line laid with all cement joints has such a high electrical resistance that, with the potential differences ordinarily found in the ground, no measurable current can flow along such a pipe line. Numerous tests made by myself confirm this. An interesting and valuable test is also reported in one of the replies. A cement jointed, cast iron main, paralleling a trolley track, was metallically connected to the track at its two ends with an ammeter inserted in one of the connecting wires. No measurable current was indicated on the ammeter. In this same system the cement jointed mains are connected to the return circuit of the railway at the substation. An ammeter was connected in this bond wire, but no current flow could be detected. Similar results were obtained in a series of tests made upon a cement jointed water main in Los Angeles, Cal., and reported by E. F. Scattergood, in a paper published in the "Sibley Journal of Mechanical Engineering;" March, 1905.

Bond connections from cement jointed mains to the return circuit of electric railways, as reported in a number of the replies, can, therefore, protect only that single length of pipe and the services connected to that one length of pipe to which the bond wire is connected, but cannot possibly serve to protect the piping system.

Discussion of Experiences with Insulating Joints.—Nineteen replies report experiences with special forms of insulating joints, and extracts from 14 of these are given in the appendix. Most of the pipe lines, where the use of insulating joints is reported, are individual high pressure lines to which no service pipes are connected. In 4 of these pipe lines every coupling is made an insulating joint, and it is reported that they do not carry stray currents and that there is no trouble from electrolysis.

In 12 of these pipes a comparatively small number of insulating joints are used, variously spaced, depending upon local conditions, and it is also reported that there is no trouble from electrolysis. Most of these lines have, however, been in service for an insufficient time to warrant the conclusion that no electrolytic action is going on.

In two high pressure lines, where insulating joints were spaced 500 feet apart, serious electrolytic damage resulted, and it is reported that these pipe lines have since been connected to the negative return of the railway, and the insulating joints bonded over by copper cables, thus eliminating the insulating feature of the couplings.

A wrought iron pipe line, paralleling a poorly constructed trolley road for 34 miles, with 3 power houses located along the line and with Dresser expansion sleeves located every ¼ mile, is reported to have suffered from electrolysis in the neighborhood of the power houses. In one reply it is reported that an entire city gas supply system is laid with wrought iron pipe, with nearly all of the couplings insulated joints, and that after 6 years of service no trouble from electrolysis has developed.

I have also had occasion to test one high pressure, wrought iron main, laid with all Dresser joints, several miles long and paralleling and running close under trolley tracks for a considerable distance. This main did not show any measurable flow of current, and a temporary copper wire connection, with an ammeter in series between the pipe and the rails at a number of points, did not produce any flow of current. This pipe line has been in service for over 5 years and so far has given no trouble from electrolysis.

Discussion of Experiences with Insulating Pipe Coverings.—Sixteen replies report experiences with insulating pipe coverings, and all but two of these refer to service pipes. One of the two mains, provided with an insulating covering, is a 2-inch, high pressure line, 1 mile long, and connected at one end to a gas works, at the other end to holders. This pipe was boxed and filled with pitch, but electrolytic trouble developed at several points, at some of which the covering was found to be defective. By breaking up the line into insulated sections by insulating joints, in addition to the covering, the trouble is stated to have been overcome. The second main is also a high pressure line, of 3-inch wrought iron pipe. The attempt to protect this by boxing it and filling with concrete failed. A portion of this line, which was boxed and filled with 2 inches of pitch, also developed electrolytic troubles at a few points, but it is stated that at these points the covering was found mechanically damaged. Examination of the pipe under good coating of pitch showed the pipe to be bright and without signs of corrosion.

Five of the service pipes protected by coverings were painted with some form of compound, usually containing tar. These coatings are found to prolong the life of the services but do not generally prevent electrolysis.

Five services were boxed and filled with pitch, which proved effective in four cases but failed in one case. Four services are reported boxed and covered with cement or concrete, and this appears to have prolonged the life but has not prevented electrolysis.

In regard to cement or concrete as a protection from electrolysis, I know of one case where an 8-inch pipe was boxed, leaving from 4 to 5 inches between pipe and box, and this space was filled with concrete. This main was in a location where currents were leaving the main, and where previously there had been considerable electrolytic action. It was found that the corrosion went on at least as rapidly

with the main imbedded in concrete as before, and the main was destroyed in a comparatively short time. When the box was broken open the iron pipe was found to be very badly corroded and pitted, and the rust had penetrated more than an inch into the concrete.

Investigations made by Knudson [1] and by Langsdorf [2] also show that iron and steel imbedded in concrete will be corroded by electric currents passing from the iron or steel through the concrete. I have had occasion to examine a steel main which had been dipped in a tar-pitch compound before being laid and which had been in service for about 5 years. The coating in most places was found to be apparently intact and firmly attached to the steel and varying from about $\frac{1}{32}$ to $\frac{1}{8}$ inch in thickness. At other places the coating appeared cracked and was brittle, or was entirely removed for considerable areas. In a locality where the main was lying in a marsh and was subject to electrolysis from stray currents, deep pittings were found in the steel under apparently good, heavy coating, which in some cases had to be scraped away with considerable force. Electrolysis appears in this case to have gone on under an apparently perfect insulating coating.

In reply to my question blank Mr. R. B. Harper, Chief Chemist of the Peoples Gas Light and Coke Company, Chicago, kindly sent me a copy of a paper on "The Comparative Values of Various Coatings and Coverings for the Prevention of Soil and Electrolytic Corrosion of Iron Pipe." This paper was read by Mr. Harper before the Illinois Gas Association, March 18, 1909, and contains the results of an exhaustive investigation of a large number of commercial pipe coatings and coverings. The results given are of great value in the study of the problem of pipe protection. The conclusions drawn by Mr. Harper are so to the point, and agree so well with my own experience, that I will quote them in full in the following:

1. "That paints as a rule do not prevent electrolysis, but some, no doubt, have a beneficial effect in curtailing soil corrosion.

2. "That the appearance to the naked eye of a paint film is no indication of its permeability to water.

3. "That corrosion of metal may take place beneath a paint film without apparently affecting the appearance of same.

4. "That the metallic body, before being covered, must be smooth and free from rust, moisture, loose scale and foreign matter in order that it be preserved.

5. "That, in general, dips applied hot are better than paints and probably furnish the key to the solution of the prevention of corrosion.

6. "That concrete of itself is not an efficient protection against electrolysis.

7. "That ingredients such as rubber, tallow, lime, etc., usually have a deleterious effect upon the efficiencies of coal tar pitch."

Mr. Harper's paper has been published in full in the issues of the American Gas Light Journal, from August 9 to September 13, 1909, inclusive.

(To be Continued.)

[Continued from Page 1202.]

PROCEEDINGS, SEVENTEENTH ANNUAL CONVENTION OF THE PACIFIC COAST GAS ASSOCIATION.

Held in San Francisco, Cal., Sept. 21, 22 and 23.

Second Day—Morning Session.

Discussion on the Morgan Paper.

Mr. Jones—Mr. President, Mr. Morgan deserves much credit for having brougnt the conditions of the system in San Francisco out of chaos into order. Few people can understand the conditions that existed after the fire in San Francisco. The streets that had been occupied by 16 and 20-inch mains were afterwards choked with debris, and the business of the city moved to streets that were supplied formerly from 4-inch mains. It was impossible to lay larger mains in the new business districts, and we were compelled to resort to higher pressures to deliver the gas. In fact, we were at our wit's end to supply the demand, yet we succeeded fairly well. Much credit is due to Mr. Morgan for having done this. His paper is excellent from many points. It includes a great many novelties. The charts showing the gradual cutting off of the gas by the accumulation of naphthaline are highly interesting. I wanted to ask him what the other fellow was doing meantime while that was going on, but I presume some patient consumer was waiting to be put in the dark, a good deal after the fashion of vivisection of animals in the cause of science. About 18 years ago the Western boundary of San Francisco was practically Central avenue, or what is now known as Presidio avenue. West thereof found very little demand for gas, and the San Francisco Gas Light Company had no mains. To-day, Presidio avenue is practically the center of the city of San Francisco, and the districts of Richmond and Parkside have grown enormously. You will all agree with me that, under existing conditions of gas, and electric service, the bungalow or cottage home, where the woman of the house does her own work cooking and heating by gas, and heating water by like manner, is the best consumer, in fact is a better consumer than a business block in the center of the city where the lighting and power are done by electricity and but little gas is used. It became necessary to get gas into this Richmond district, and Mr. Morgan explained the means of bringing it about. That has been done temporarily, but in order to increase our facilities for delivering gas in the future, for San Francisco is very rapidly growing, it has become necessary to follow a policy outlined by our President in his address; that is, the combination of high and low pressure distribution. We anticipate laying a 16-inch, high pressure main (a steel tube) from the Potrero station to North Beach station, practically passing through the largest gas consuming districts of the city, and delivering gas wherever it is called for, through district governors, and at its terminal delivering gas into the North Beach holder. This saves the filling of the North Beach holder through the city mains, through the ramification of pipe leading from Potrero to North Beach, and maintaining a pressure after midnight on the city pipes, that is out of all reason, compared with the pressure act usually required to deliver gas at that time during the minimum consumption. The Company is fortunately situated at present in having on hand two compressors with a maximum pressure of 40 pounds per square inch, and capable of delivering 5,500,000 cubic feet of gas per 24 hours each. That will give us 11-million feet capacity in the new 16-inch tube, and will probably reinforce the present low pressure system in San Francisco for many years to come, thus saving much money in the laying of new low pressure mains. Mr. Morgan speaks of the duplication of mains in certain streets in San Francisco. This was primarily brought about by the introduction of cable railroads, using deep yokes for carrying the cable, and necessitating the trapping of every service in crossing the street. We found it was necessary, where a cable railroad was extended through a certain street, to lay another main on the other side of the street, thus shortening the services and enabling us to properly drain them back to the mains. The Company has been criticised for having this duplication of mains. It has been claimed that it adds to the charge against plant on our books, but no arguments have yet been brought forward which prove to my mind that a duplication of gas mains under our modern asphalt pavements is not the best method of supplying gas to a large city. In streets like Montgomery and Kearney, in San Francisco, where the traffic is great, I believe it is almost criminal to attempt to open up the entire width of the street, even a part at a time, for the purpose of putting in service pipes. I believe any company is warranted in expending the money for duplication of its mains, getting a good sized main on each side of the street, both to insnre constant service and avoid the nuisance of tearing up the street in the busy parts of the city.

Mr. Berkeley—With particular reference to what Mr. Jones has said about double lines of mains, I will say that it has been found excellent practice. There is no doubt in my mind that a gas company can figure it bringing it down to a commonsense economical basis. It overcomes the disadvantage where the main is on the long side of a street and lessens the advantage of the consumer on the short side. In the matter of numerous services crossing the street, subjecting the same to electrolysis, is another cause why it is advantageous. Where the streets are wide and a main on either side close to the cnrb, will figure a less total cost than one large main. While the plan has been criticized, I believe some of the large companies are more generally adopting it in the future constructions. The efficiency of delivery is increased at least 100 per cent. when you consider short services, removal from danger of electrolysis and frequent tie-ins, gaining reinforcement from intersecting streets. I want to heartily commend Mr. Morgan for his paper. Further, gentlemen, I am going to say to you that we are not taking enough interest in the discussion of these papers. The men who write them are putting time and thought into them; we are traveling miles to come and listen to them. I say it again, we are not taking enough interest in them. These men cannot write papers at random and give specific information without much

1. "Electrolytic Corrosion of Iron and Steel in Concrete," by A. A. Knudson. Transactions of American Institute of Electrical Engineers, 1907.

2. "Electrolysis of Reinforced Concrete," by A. S. Langsdorf. Journal of the Association of Engineering Society, Feb., 1909.

labor; therefore, if it is worth what Mr. Morgan has put into it, it is worth our time to get up and say so.

Mr. Cline—Mr. Jones' remark reminds me of something that may be of interest to the gentlemen now connected with the gas companies here. I recall on the Hayes street cable line, some 25 years ago, the Company had a 6-inch main on one side of the street. They wanted to have the roadway cleared so as to put in a cable line, and, after considerable discussion, paid for the entire line on the other side of the street—actually paid for a duplicate 6-inch line, and the Company disconnected a row of service pipes. I don't know what the practice has been since those days. Mr. Morgan, have you had any objection from the gasfitters or property owners to putting the meters on the ground floor owing to the cost of dropping the rise pipes?

Mr. Morgan—Yes; we had some objections in the portion of the city known as Chinatown. The practice has been to place the meters on every floor, scattering the meters all through the building. We had a competing company in that district, and in order to get our gas into the building we did that; but we have made arrangements with those people now, and we are trying to keep the meters all on the ground floor. It is dangerous to have a live pipe in the building, particularly in a frame one. In case of fire it is impossible to cope with the gas.

The Chairman—In a great many instances where companies have undertaken to establish that rule, which I consider an excellent one, it has been more or less jeopardized by the willingness of competing companies to set the meters above the ground floor. It is very hard to enforce the rule where there is competition, and the property owners at the outset will object to the extra cost of extending a rise pipe from the ground floor. Another novelty was the painting of the meters a different color each year. While you can depend on the records for the change of the meters, it seems to me it was a graphic plan, that the color of each particular year would speak for itself, or so you could know it without referring to the records.

Mr. Morgan—I think that was advised by Mr. Jones.

Mr. Jones—I believe the credit for getting that up belongs to Mr. Pabst, of Portland, Ore. It is an excellent plan, but I think in using the colors it is much better to get away from primary ones as far as possible. This is, study the colors used in painting houses. Where we have so many meters out-of-doors, it is much better to use grays, browns or drabs, inoffensive shades of colors, rather than to use primary colors like red, green or blue. The old black meter is about to disappear entirely. The black meter is one that has been brought in and repaired or condemned during the last year, and the new meters will be painted cheerful colors. Another matter which slipped my mind Mr. Morgan brings up. When the chart showing the instantaneous great variation in pressure due to the lighting of a large gas appliance like a water heater was shown, I saw a smile go over the faces of some of the members. It seems that gas appliance must have taken all the gas out of the main instantaneously; but I find it takes a very small opening on a large main, if it is uncovered at once, to cause a drop in the pressure of 2 or 3 inches. I have in my private office a Bristol recording gauge on the street main directly in front of the office, which has been a large main in every case. At our old office there was a 1¼-inch pipe directly connected between a 10-inch main and the office, and on the end of this service, from which no gas was taken for other purposes, was placed a Bristol recording gauge. After studying the gauge for a few days, I noticed drops in pressure in places on the chart line where the pressure would go down 2 inches and return again to normal without an apparent reason. I was puzzled by variations in pressure, where the pressure would rise or fall 2 inches below the line and return to normal, all happening in a moment of time. I made up my mind I had to discover the cause and set to work to find out what happened within 2 to 4 blocks of the office at that time. I found the variations in pressure were caused by the use of an ordinary bell pump, the use of which within two blocks would change the pressure 4 inches, from 2 above normal to 2 below normal on a Bristol recording gauge.

Mr. Basford—I believe the gas appliance men in general don't make a sufficient study of such matters as those treated in the paper by Mr. Morgan. Charts 5 and 6, showing the great variation on certain types of devices that have been used, would be sufficient in itself for gas appliance men to make up their minds they must study these conditions better. It has been my fortune to refer to Mr. Jones several times, and Mr. Barrett has very kindly had records taken in different parts of the city where we had appliances, to see what the conditions were in certain services. I believe the gas appliance men could make their appliances more efficient if they would find out from the gas company what the proper services should be for their devices, insist that they go in the buildings, even going farther than that by writing specifications for the architects when they are putting up these buildings, that will call for the proper sized services to put in the structures. I have in mind where numbers of our devices were put in. We wrote a specification for a large service, and it was just about that time this discussion came up between Mr. Jones and myself. The requirement really called for another service. The fellow had no contract for it. His contract only called for one service. There was quite a discussion between the owners. They wanted us to put it in. It ended up by their paying the bill. The owner at that time said, "I guess the company wants to get more gas in the building." I believe the appliance man can help out the gas man in that regard. Another thing. The owners have always complained to us about poor gas. I know, from analysis of the gas, that we have one of the finest gases in the world. A head of our factory had occasion to remark to Mr. Jones about the wonderful heating value of San Francisco gas, and I think it is the policy of the gas appliance men to stand by the gas companies, not at the same time putting a chip on our shoulder, but showing in an intelligent, friendly way what the gas company is trying to do. A case on 4th or 5th avenue, between Lake street and the Presidio wall, where there were about 3 gas services and about 12 ranges in one block, showed the service was about 3 inches—that is, the main which was laid there at a time when there were no people there—and nobody could have foreseen the amount of gas to be used in that street.

Mr. Jones—That was a 2-inch pipe.

Mr. Basford—It was very small; but nobody could have imagined that such an amount of gas would be used in such a short time on such a street. This subject is very dear to my heart, and I hope all of us will go from here resolving to study this thing so we can all get together on these matters. I want to see all get together with the gas company, study the conditions and make up their minds they are going to be one of the means of education to keep the customers of the gas company more satisfied. We can do a great deal for them, and it only redounds to our own credit and saves us a lot of trouble.

Mr. Keyes—Coming back to the proposition of different sized mains, I would like to say a few words. Speaking about laying say a 4-inch main on each side of the street, wouldn't it be more feasible and cheaper to lay a 6-inch main, for instance, on one side of the street where a street is going to be permanently improved, and then lay whatever sized service you intend to lay to all vacant lots and all houses, whether you secure the house of a customer or not? Wouldn't it be cheaper to lay your service to the inside of the curb? That is the way it is done in Sacramento on all permanently improved streets, and I think that in the end the company will find it much cheaper than to duplicate a smaller main. You get more than twice as much gas from a 6-inch main than you do through a 4-inch if you duplicate the main, and I think it would be cheaper to lay the service to the inside of the curb to every vacant lot, to every house, whether you ever secure it as a customer or not.

Mr. Cline—You might say, regarding the cost, with equal carrying capacity of one or two mains that one main is the cheaper, but there are other advantages Mr. Jones pointed out that are very important and that are included in Mr. Morgan's paper.

Mr. Jones—Mr. Keyes is theoretically correct, but we found by experience that, when we run services inside of the curb, we have to almost foresee future conditions, and we cannot do that. We are not prophets, and I never have yet in my experience as a gas man been able to find the service inside of the curb. I would like to be able to say that I had found one, and that it was not suitable, was not the right size or was eaten out, but I never yet have been able to find one. Usually the records of the gas companies in the past have located such services as so many chains northeast-of-east from an oak tree, or something like that, but when you go to it the oak tree isn't there, or the fellow hasn't the surveyor's chain handy. It is really a waste of money to do it.

Mr. Keyes—We take our measurements from the exact corner of the street and the center of the curb line and make an exact map of the district, showing where that service is to be found. We have yet to find any trouble in that connection.

Mr. Basford—I don't know how a gas company could foresee a condition like this. To-day a great many gas furnaces and heaters are being put in. The natural idea would be, in laying out a street of that character, to put in 1¼ to 1½-inch pipes. Suppose you put in a 1½-inch pipe and a man builds a set of flats or an apartment house. We have a case where there are some 12 devices besides ranges in one

building, which would require alone a 2 or 3-inch main. How could the company foresee that? And these cases are occurring all the time, especially in a large city like San Francisco.

Mr. Clements—My friend on the right complains against the lack of debate upon the several papers. Now, to take an equal number of men, you will not find as many modest men as you do among the gas men; but I want to say, because of the fact that some of the gentlemen do not discuss these papers, it is not an evidence that they lack nterest in the papers. These men will read these papers after their return to their respective homes or places of business, and it will be a source of benefit and a source of knowledge to them to be handled and used hereafter. I know the gentleman intended nothing serious. He felt more ought to be said. However, in proof of the words that I have uttered, coming up the street this morning from the ferry I was overtaken by several members of this Association at one point. Then, again, I met others, who would say "Good morning; aren't we having a splendid meeting? Haven't we had some thoughtful papers? Are they not instructive?" So you see the interest these men are taking. Yet they are not men who can get up on the floor and discuss these things. I simply want to defend my modest fellow gas men.

Mr. Berkeley—What I said was in the kindliest of spirit, and I do not want anyone to think I am a chronic kicker, but if there is any go to a thing I would like to hear some one say so. I take no affront at what my friend said, but the proof of the pudding is in the eating of it. If you say something in this meeting you will say something in the next, but if you do not say anything in here you are not liable to say anything at the next.

Mr. Parker—Adding to Mr. Berkeley's remarks about the discussion of the papers, the only way to get the meat out is by discussion. I am attending 10 or 12 gas conventions a year, and notice the little difference sometimes in our worthy presidents. Some of these will say "Mr. Adams, what is your experience in Stockton? Can you enlighten us a little bit?" And there is a lot of experience just waiting to be asked. They won't get up voluntarily. If you call them by name they will be glad to rise. A valuable paper was just read on "New Business Methods," but there was no discussion. Perhaps you don't sell gas in San Francisco; but come in and buy it. This man down in the lower part of the State has to sell his gas and wants to know how to do it. A valuable paper was passed up there, and I was very sorry there was no discussion. Again, the paper on lampblack. Just think how valuable it was, and the information it contained. I am not criticizing our worthy President, but as he knows most of the members, if he will call on them we will get information from unexpected sources sometimes that will be of value to us.

Mr. Jones—I rise in defense of our worthy President. I have attended gas meetings all over the country for a great many years, and I never have attended a meeting that presented a programme which filled up every moment as this does. With 17 papers and 10 or 11 other items on the programme it seemed impossible we would ever get through with them by simply reading the papers. I know Mr. Cline has been afraid to call on people for fear he would not get through this week. With 17 papers, Mr. Cline, with his ability as a parliamentarian and his knowledge of the gas business, could easily extend this meeting till next Sunday night.

Mr. Berkeley—As a final, I think I have accomplished getting an argument up.

Mr. Hill—A question that the paper suggests is just what the views of any of you are as to the advisability of putting in stopcocks somewhere between the mains and the meter, and as to what would be the proper place to put them. We had a fire down our way not very long ago, and when our men got there they had to dig up the street in order to shut off the 2½-inch gas service. That is a question I would like to hear some of the wise wigs answer.

The Chairman—What is the practice in San Francisco?

Mr. Morgan—We have discontinued stopcocks on all but large services, say 2½ to 3-inch, for the reason they stop up all the time. We have trouble with naphthaline stoppages at the stopcock. In large services we put the stopcock in the gutter, just outside of the curb line, and the fire and service-men know where to look for them. Another thing is to keep meters in the front part of the building where they can be got at. If meters are set uniformly, the firemen know where they are, and they can shut them off with the stopcock at the meter connection, and there is no danger from fire.

Mr. Jones—A reason why we don't use stopcocks on small services is that some years ago a fellow built a factory. Wanting to know that any little incipient blaze would be extinguished quickly, he equipped his entire factory with hand grenades. One night his factory burned to the ground. We went to the factory site and saw his watchman, who was a good, careful Irishman, and said to him, "Why didn't you use the hand grenades?" The reply was, "Be gorra, I couldn't find a corkscrew, sor."

Mr. Lowe—This wise wig wants to tell Mr. Hill if he does put in service cocks he will have to dig them up anyway, for after a few years they will be stuck so he can't turn them.

Mr. Hill—I am looking for information and am not acting in the guise of a critic or lecturer. I want to know what is the practice and what has been the result of the experience along that line. Does it seem best to put the stopcocks at the meter or at the curb or any other place? There must be a best way as the result of the sum of all the experiences gas men have had up to date. I am making an honest confession that I don't know.

Mr. Lowe—Thirty odd years ago, when I started running service pipes, I bought all the devices that were presented to me, including a beautiful outfit of service boxes running down from the curb to the main; in fact, everything I could find I put on the services, just as I at first put everything I could find on my automobile, until I had more weight on the dashboard than my entire car now weighs. Experience has taught me to discontinue those, and so it is with these service devices, except in making high pressure connections, where, of course, it is necessary to use a so-called "corporation cock" at the main in tapping the pipe; other than this there is no method of closing the service until it reaches the cock at the meter. I have followed this plan consistently and have no cause to regret the practice.

Mr. Hill—What is the philosophy of putting a stopcock in high pressure at the main?

Mr. Lowe—To save the escape of gas in tapping the main.

Mr. Hill—Then the stopcock serves no other purpose?

Mr. Lowe—No, sir; and at the best it is a very inefficient, leaky device. I am very glad to say I have devised a method of overcoming its use by a service clamp fitted with a drill, left permanently in place, which will do away with the unsatisfactory and expensive corporation cock.

Mr. Hill—Why couldn't you use an ordinary tap machine such as the water companies use for tapping water mains under pressure?

Mr. Lowe—You can; but you have to use a cock with it, while this little device of which I speak is very simple indeed. It is a service clamp fitted with a drill passing through a stuffing box; you fasten the clamp to the main, push down the drill, drill the hole, withdraw the drill a certain distance and leave it there, the service pipe having been previously run to the meter cock. We are now trying these out in a small way in the various companies which I manage and they seem to be working satisfactorily. They do away with the cost of service cocks, and also eliminate subsequent leakage.

Mr. Schade—I think I can answer that question. It matters little where you pay it. But put it somewhere where anybody can get at it without standing on his hand, or in any other awkward position he may have to assume in order to shut it off. If you had had the experience I have had you would sympathize with me. I think a stopcock should be put in any place where it is acessible to anybody who has occasion to shut off the gas, and I think the gas companies should see to it, because it is sometimes very difficult to shut off a meter where there are a half dozen or more meters. In fact it takes a body about 16 feet long to wind around like a snake to get to the stopcock to shut it off. On several occasions when called upon to test meters, I had to give it up and call on the company to send me a long, slim man to do it. It was impossible for me to do it.

The Chairman—Did you refer, Mr. Schade, to a service cock or a meter cock?

Mr. Schade—I might call it a service cock in a way. Of course, it is a separate cock that does not affect the meter at all.

Mr. Hill—I know different companies have all sorts of experiences. Many men are not willing to get up and display the same quality of ignorance I am displaying in this matter, but I know that a great many small companies have all sorts of practices, for I have talked with their service men and superintendents. Some of them put service cocks in the streets, some use the common lever cocks at the meters, and some use the ordinary flathead cocks. There are all sorts of practices and all sorts of notions regarding the matter, and I was merely attempting to find out what seemed the best practice. It is a little thing, but we find in our business the little things worry us sometimes the most.

Mr. Jones—With low pressure service I think a good big potato to

shut off the gas in case of fire is about the best thing you can get hold of. I have used them hundreds of times.

Mr. Lowe—Or a "chaw" of tobacco.

Mr. Valentine—Or a bar of soap.

Mr. Strange—Did Mr. Morgan in his experience in San Francisco meet with any soils that rapidly deteriorate black iron and steel pipe. If so, what methods have been used to overcome it?

Mr. Morgan—In some cases we find that ashes or cinders will eat through a pipe in the course of 2 or 3 months, and coating the pipe does not seem to do any good. In such cases we simply dig out the trench and fill it with clean sand, enough to protect the pipe, and lay a new pipe, providing we cannot put the pipe in another place where it will be in a different character of soil.

Mr. Strange—Do you still lay black pipe?

Mr. Morgan—Yes, sir. We put in plenty of sand, dig the trench about a foot below the pipe and fill it so it is covered for 12 inches all around the pipe. The pipe is coated with black paint.

Mr. Strange—We have had similar experience in Honolulu, and found it necessary to relay every pipe in the city with galvanized pipe.

Mr. Morgan—There are very few locations in San Francisco where we have trouble of that kind.

The Chairman—To what do you attribute your trouble, Mr. Strange? What is the formation of the soil?

Mr. Strange—A coral and lava formation. In many places I suppose the seepage of sea water is responsible for it.

Mr. Lowe—Volcanic ashes?

Mr. Strange—Yes, volcanic ashes and coral. The black pipe lasted about 18 months to a year.

Mr. Lowe—Have you analyzed the soil?

Mr. Strange—No, sir.

Mr. Lowe—Are there any portions of your territory wherein the pipe does not corrode?

Mr. Strange—No. This has also been the experience of the water and the railroad companies. Some now, I understand, in order to avoid the expense of galvanized pipe, black paint the pipe and saturate the soil with crude oil.

Mr. Lowe—Have you any cast iron pipe laid?

Mr. Strange—No; all wrought iron.

Mr. Lowe—Many years ago I had some experience with cast iron pipe laid in ashes, and found that the latter was eaten through in a very, very short time. When the trouble occurred there was only ashes in the street, and the cast iron pipe was destroyed in a year or so, it becoming spongy and porous. We excavated and filled in with good earth and then laid new pipe.

Mr. Kirk—Was it good pipe when it was put in?

Mr. Lowe—It was in the old days of low pressure system, when we bought the best material we could, brand new, from the foundries.

Mr. Kirk—I came across a cast iron pipe that, when you cut it, it was just like a sponge.

Mr. Lowe—I am familiar with that difficulty, but there was no trouble in this instance with any of the pipe save in this particular spot. When the excavation was made to find the leak this bed of ashes, about 50 feet long, was found. It had evidently been a fill-in, and at that particular spot the cast iron pipe was eaten through in about a year.

Mr. Kirk—I have found the same thing in steel pipe, but not in cast iron. We had a place in Oakland where the ground had been affected from an adjacent pickle factory, and the pipe we put in lasted only about 2 years.

Mr. Hollidge—I have seen services run across the street, which were subsequently affected by chemicals of different kinds, that a coating of hot pitch will preserve the pipes indefinitely. I have seen them dug up after 25 years use, and were just as firm and solid as the day they were put in.

Mr. Lowe—That would be a pretty difficult thing to do in these days of no pitch, Mr. Hollidge; that would now be difficult with us on this Coast.

Mr. Kuster—Is not that similar to the old method of coating it with coal tar?

Mr. Lowe—Yes; much the same thing, save a heavier coat. The plan has been extensively used, but is very expensive. It should last for infinity.

(To be Continued.)

The residents of Port Arthur, Ont., are clamoring for a gas works, and so are the people of the adjoining district of Fort William.

Meeting Times of the Various Gas Associations.

American Gas Institute.—Annual meeting, October, 1910. Atlantic City, N. J. Officers: President, Wm. H. Bradley, N. Y., City; Secretary, A. B. Beadle, 29 West 39th street, N. Y. City.

Canadian Gas Association.—Annual meeting, June, 1909. Hamilton, Ont. Officers: President, J. S. Norris, Montreal, P. Q.; Secretary and Treasurer, A. W. Moore, Woodstock, Ont.

Empire State Gas and Electric Association.—Annual meeting, Nov., 1910. New York City. Officers: President, C. R. Huntley, Buffalo, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street, New York City.

Guild of Gas Managers of New England.—Annual meeting, December. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, A. K. Quinn; Newport, R. I.; Secretary, Walter G. Africa, Manchester, N. H.

Illinois Gas Association.—Annual meeting, time, March 18, 1910, Chicago, Ills. Officers: President, E. G. Schmidt, Springfield, Ills.; Secretary-Treasurer, C. B. Strohn, Elgin, Ills.

Illuminating Engineering Society.—Annual meeting, January 14, 1910. Meetings of Sections, monthly. President, W. H. Gartley, Philadelphia, Pa.; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York: Secretary, Albert J. Marshall, 227 Fulton street. New England, Secretary, L. D. Gibbs, 39 Boylston street, Boston, Mass. Philadelphia, Secretary, F. N. Morton, Broad and Arch streets. Chicago, Secretary, T. R. Beebe, 157 Michigan avenue,

Indiana Gas Association.—Annual meeting, January 19, 1910, Indianapolis, Ind. Officers: President, J. W. Dunbar, New Albany, Ind.; Secretary-Treasurer, Philmer Eves, Indianapolis Gas Company, Indianapolis, Ind.

Iowa District Gas Association.—Annual meeting, time, June 23, 24, 25, 1910, Sioux City, Ia. Officers: President, Geo. H. Waring, Omaha, Neb.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, ———— Wichita, Kas. Officers: President, W. A. Scothorn, Hutchinson, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, September, 1910; ———— Officers: President, B. O. Tippy, Grand Rapids, Mich.; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April 14, 15 and 16, 1910; Jefferson City, Mo. Officers: President, W. A. Bixby; Secretary and Treasurer, C. L. Clary, Sikeston, Mo.

National Commercial Gas Association.—Annual meeting, Dec. 14-22, 1909; New York. Officers: President, J. D. Shattuck, Chester, Pa.; Secretary-Treasurer, Lucius S. Bigelow, 106 Fulton street, New York City.

Natural Gas Association.—Annual meeting, May 17, 18 and 19, 1910; Oklahoma City, Okla. Officers: President, William H. McKenzie, Kansas City, Kas.; Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, third Wednesday in February; Boston. Officers: President, Walter G. Africa, Manchester, N. H.: Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

Oklahoma Electric Light, Railway and Gas Association.—Annual meeting, May 18, 19 and 20, 1910; Oklahoma City. Officers: President, F. H. Tidman, Oklahoma City, Okla.; Secretary-Treasurer, Galen Crow, Guthrie, Okla.

Pacific Coast Gas Association.—Annual meeting, ————, 1910, Los Angeles, Cal. Officers: President, W. B. Cline, Los Angeles, Cal.; Secretary-Treasurer, John A. Britton, 925 Franklin street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April 13, 1910, Easton, Pa. Officers: President, E. G. Holzer, Easton, Pa.: Secretary-Treasurer, William H. Merritt, Lebanon, Pa.

Society of Gas Lighting.—Annual meeting, Dec. 9, 1909; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 1123 Broadway, New York.

Southern Gas Association.—Annual meeting, Feb. 16, 1910, Chattanooga, Tenn. Officers: President, R. C. Congdon, Atlanta, Ga.; Secretary-Treasurer, James Ferrier, Rome, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. ————, 1910, Beaumont, Tex. Officers: President, R. B. Stichter, Dallas, Tex.; Secretary's office, 300 Commerce street, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 11 and 12, 1910, Milwaukee, Wis. Officers: President, R. B. Brown, Milwaukee, Wis.; Secretary-Treasurer, H H. Hyde, Racine, Wis.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

940,046. Apparatus for Lighting and Extinguishing Gas Lights from a Distance. J. F. Nassen and A.E.T. Bergstrom, Stockholm, Sweden.

940,103. Gas Washer. W. Feld, Honningen-on-the-Rhine, Germany.

940,114. Proportional Meter. J. C. Anderson, Highland Park, Ills.

940,276. Gas Lighter. F. H. Pomeroy, Bradford, Mass., assignor, by mesne assignments, to Safety Gas Lighter Co., Haverhill, Mass.

940,289. Process of Manufacturing Mixed Coal Gas and Carburetted Water Gas. W. Thomas, Vancouver, British Columbia.

940,304. Automatic Oiling Device for Gas Meter Diaphragms. J. R. Daly, New Orleans, La., assignor to J. E. Cross, Baltimore, Md.

940,391. Regulator for Gas Stoves. A. M. Johnson, Early, Ia.

940,458. Gas Main Stopper. P. Goodman, New York City.

940,493. Vibratory Disintegrator for Gas Producers. J. J. Astor, New York City.

940,595. Purification of Burner Gases. J. B. F. Herreshoff, New York City, assignor to General Chemical Company, same place.

940,596. Apparatus for Purifying Burner Gases. J. B. F. Herreshoff, New York City, assignor to General Chemical Company, same place

940,610. Gas Lighting and Extinguishing Apparatus. V. C. J. Nightingall, Melbourne, Victoria, Australia, assignor to The Nightingall Gas Control Company, Limited, same place.

940,629. Shock Absorbing Device for Gas Mantle Fixtures. H. E. Woods, Chicago, Ills.

940,639. Incandescent Mantle. O. Kaufmann, New York City, assignor to Block Light Company, same place.

940,696. Gas Producer. R. B. Kernohan, Pittsburgh, Pa.

940,916. Supply Tank and Carburetter for Gas Plants. F. B. Alldredge, Des Moines, Ia., assignor to M. B. Alldredge, same place.

940,925. Water Gas Apparatus. S. J. Dickey, Philadelphia, Pa., assignor to The United Gas Improvement Company, same place.

941,141. Gas Stove Frame. F. Graff, Jr., Middle Village, N. Y.

941,352. Distillation of Bituminous Coal or Similar Carbonaceous Substances. T. Parker, Ironbridge, England.

Items of Interest
FROM VARIOUS LOCALITIES.

MR. C. W. HOOVEN, of Anderson, Ind., has been appointed Manager of the Southern Indiana Gas Company.

MR. ARTHUR J. SMITH, formerly under Mr. W. G. Africa at Manchester, N. H., and later on Superintentendent of the combined plants of St. Albans and Bennington, Vt., has been appointed Superintendent of the gas division of the General Electric Company's lighting plants at Schenectady, N. Y.

THE November meeting of the Terre Haute (Ind.) Science Club, which was held in the physical laboratory of the Normal School in the named city, was notable for a large attendance, and an excellent paper giving "Some Gas Tests on Indiana Coal," by Dr. John White, of the Rose Polytechnic.

MR. GEORGE W. DRESSER, for several years Manager of the Warsaw (Ind.) Gas Company, will add the duties of Superintendent to his schedule. Miss Mary Koontz has been elected Treasurer of the Company.

THE Consolidated Gas, Electric Light and Power Company, of Baltimore, Md., is extending its mains to the settlement of Westport. The line is being laid through the famous Annapolis road, the tearing up of which thoroughfare was forbidden by a legislative act, the intent of which was to keep the road intact for a period of 5 years. The Westport Improvement Association, however, made such a strong argument that all parties in interest agreed to a waiver.

A SOMEWHAT mysterious corporation was recently formed in Portland, Me., the purpose for which it was organized, as set forth in the articles filed with the Secretary of State, being "To manufacture and deal in machinery for purifying, scrubbing and condensing gas." The concern is capitalized in $500,000, and its officers are: President, C. E. Eaton, Portland; Treasurer, T. L. Croteau, also of Portland.

THE public lighting of Philadelphia, in so far as that lighting is dependent upon gasoline lamps, has been awarded to the Welsbach Light Company, at its bid of $29 per lamp per annum.

MR. JAMES P. DOWD, for a lengthy period in the employ of the Utica (N. Y.) Gas and Electric Company, died at his home (112 Brinckerhoff avenue) in that city the evening of the 15th ult. He was in his 71st year.

THE proprietors of the Taunton (Mass.) Gas Light Company have virtually put the selling rate there at $1 per 1,000, the reduction to go into effect the first prox. The new schedule calls for $1.20 per 1,000 gross, less 20 cents per 1,000 cubic feet for prompt payment.

MR. GEORGE ROEBUCK formerly Superintendent of the plant at Williamstown, Mass., has been appointed General Inspector of the Massachusetts Company's North Adams, Adams and Williamstown branches.

THE entire property and equipment of the Zanesville (O.) Gas Light Company have been secured by Mr. W. Hunter Todd. It is understood that in time natural gas will be supplied only in Zanesville by the parties to whom the nominal sale was made.

THE business of the Astoria (Ore.) Electric Company, as to its gas division, has increased to the point where it became necessary to enlarge the generating section thereof. With that satisfactory end in view the Company has ordered the Gas Machinery Company to construct for it a new oil gas apparatus and a set of purifiers.

"L.," WRITING from St. Louis, under date of the 23d inst., says: "The La Porte (Ind.) Gas Company has taken a 'little hint,' or to be more explicit, has ordered from the Evens & Howard Firebrick Company one of the latter's patent retort house governors. This, together with the new 'Star' benches now being built there, will make the retort house one of which Manager Cook may well be proud."

MR. G. BREWER GRIFFIN has recently been appointed Manager of and is actually engaged in directing the sales' policy of the Detail and Supply Division of the Westinghouse Electric and Manufacturing Company, in which department transformers, meters, fans, heating appliances, switches, switchboards, railway line material, etc., are sold. Mr. Griffin has been Assistant Manager of this sales' department for the past 6 years. He was previously connected with the sale of detail apparatus in the Boston office, altogether having been employed some 7 years with this Company. Prior to his connection with the Westinghouse Company Mr. Griffin was special representative with the Manhattan General Constructing Company, of New York. In fact, he opened the Boston office of the latter concern.

MR. J. KILGORE, of Altoona, Pa., is now in active charge of the manufacturing division of the Hollidaysburg (Pa.) Gas Company.

THE plant of the Baton Rouge (La.) Electric Company purposes to give more attention to its gas plant, which, to tell the truth, has been woefully mismanaged. To make anything out of it would seem to call for complete reconstruction.

THE New York *Herald* of last week reported that Governor Hughes had appointed a Mr. Edward B. Whitney to be a Judge of the Supreme Court to fill the vacancy caused by the resignation of Judge Henry A. Gildersleeve. In noting several things done by Mr. Whitney as entitling him to the honor thus conferred (to say nothing of the salary, the interim restings, etc.) it reports that, "As counsel for the Peoples Institute and other organizations he led the opposition to the Remsen gas bill of 1904 before the Mayor of New York and the Governor of the State." This strikes us as a queer need of praise for his skill as a lawyer, for everything that the Consolidated Gas Company's counsel asked through the operation of the Remsen measure was subsequently granted by means of orders passed at the direct instance of the Supreme Court. The so-called "Remsen gas grab" was simply a measure that would give to the Consolidated Company the sanction of the State *at once*, instead of waiting months and more for the things wanted, through going along in the ordinary methods of procedure under its charter rights. The Remsen bill was simply an expeditory measure.

HERE are some figures that go to show whether or not the parties who constructed the plant of the Amarillo (Tex.) Gas Company, which commenced operations in January, 1907, knew whether or not the operation was likely to be a successful one:

Year.	Month.	Monthly Sendout. Cubic Feet.
1907,	October	947,500
1908,	"	1,286,700
1909,	"	1,542,000

Year.	Total Consumption. Cubic Feet.
1907	7,374,200
1908	12,331,100
1909 (Nov. and Dec. estimated)	18,000,000

AT the annual meeting of the Rochester (N. Y.) Chamber of Commerce, Mr. Robert M. Searle (our own "Bob." Searle) was elected Third Vice-President.

THE proprietors of the Laurel Springs, Magnolia and Clementon Gas Company have filed a petition with the Township Committee of Voorhees township, with the object of securing a franchise to pipe the streets of Gibbstown and the other named places for the purpose of supplying gas to the residents thereof.

THE expert (a Mr. Merrill) appointed by the authorities to determine the value of the property which the Galt Gas Light Company pro-

osed to turn over for operation on public account, returned that alue at $35,000. The owners of the Company valued it at $60,000.

"W. T. M.," writing from Escondido, Cal., under date of Nov. 26th, says: "I presume a line or two from this far-off place will not be amiss, particularly if that has reference to public utilities, which two words have attained great prominence in the verbose vagaries of the 20th Century. Escondido has grown somewhat fast in the past 10 years, and if indications are to be had from the extent and variety of the construction going on in this section, Escondido's growth is little more than commenced. However, as to the Escondido Utilities Company and its growth—for in these your interest lies: The Company is now hard at work completing an electric power house, of the dimension of 52 feet by 32 feet by 24 feet in height, the design of the structure being Colonial, and the nature of the construction is reinforced concrete. The steaming provision comprises two boilers of 250-horse power each, to be located at one side of the structure, the dynamic outfit being on the other side. To the rear of this structure, and facing the tracks of the Santa Fe Railroad, will be located the gas plant—this will be undertaken in a month or so—and to the right of the latter will be located a modern, up-to-date ice making plant, the major portion of the output of which will be used in the proper keeping of citrus fruit, prior to its shipment east—this is a great shipping point for many of the orchard men of our fruiterers' paradise. The crowning glory, however, of the outfit (a thing in which Manager C. C. Glass sets much store) is that right at the main entrance to the power house a large steel mast is to be stepped, at the top of which will be placed an electric arc, the resulting thousands of candle power from which will blazen to the surrounding territory for miles and miles, that Escondido's people will not bushel their light, no matter how many other places follow a different way. So much for my prefacing note, which goes to show that you will hear from me again respecting our handsome, busy home-spot."

W. GRAY HOOPER informs us that one of the prominent physicians of San Francisco recently passed away in the death of Mr. George L. Luse, who died in that city the morning of the 14th ult. He was in his 70th year, having been born in Cincinnati, O., December 16th, 1839. He was one of those who helped to establish the Ashtabula (O.) Gas Company over 40 years ago, and is survived by two sisters (Mrs. B. C. Wilson and Mrs. J. G. Dunn), both residents of Ashtabula. He was a resident of San Francisco for 30 years.

THE St. Clair County Gas and Electric Company evidently did the right thing in respect of its Belleville district when it elected to have an office home of its own. To show that the opening sentence here is not idle talk, we submit the following, forwarded by a correspondent under date of the 22d ult.: "The St. Clair County Gas and Electric Company, of the Belleville (Ills.) district, now occupies its spacious and elegant new quarters, corner of Illinois and A streets, all under the capable supervision and direction of Mr. W. P. Murphy, who certainly is to be complimented upon the elegant display of gas goods. The show room is artistic and attractive, lighted by the aid of modern burners kept up by intelligent supervision. The formal opening of the quarters was noted for the number of visitors who accepted the Company's invitation to look things over. Cooking by competent demonstrators was done in the presence of interested spectators, who subsequently shared in putting away the output of the cooks' genius. Carpet beaters and sweepers, washing machines, wringing apparatus, ironing devices and the like were shown in actual work, and a line of cookers manufactured by the Belleville Stove Works was in strong evidence. Taken altogether, the display is easily the most complete that has been made in this city regarding the great things that may be accomplished by the use of gas and electric currents for purposes other than lighting in the office, the store and the home."

THE new gas works at Fort Atkinson, Wis., will be completed by the holidays, at least so the contractors say. This would prove a very quick piece of construction; in fact, were the work accomplished or finished by February 1st, both owners and constructors would have good cause for congratulation over the speed of their constructive task. The Company will begin active operations with 200 consumers, and judging from inquiries for gas from those residing in sections away from the lines of gas mains, as originally planned, it is a certainty that next spring notable extensions will have to be made to the piping system.

IN the suit for damages, brought against the Providence (R. I.) Gas Company by Michael Mulvaney, which was recently tried in the Superior Court by Judge George T. Brown and a jury, the Court directed a verdict for defendant. The plaintiff (who placed his damages at a valuation of $15,000) averred that, while working as a laborer in a ditch through which a pipe of the Company ran, an explosion of gas occurred that caused him severe bodily pain. He further alleged the explosion was caused by some defect in a pipe or valve attached thereto. The Company's case was conducted by Messrs. Edwards & Angell.

MR. B. L. DULANEY and associates have concluded a trade whereby the properties of the Bristol (Tenn.) Company have passed into the control of New York capitalists. Prominent in the latter is Mr. W. A. Williamson.

THE long-continued competition over gas at Atlantic City, N. J., having been terminated through the peaceful intervention of the Geist syndicate, the selling rate has been adjusted at $1 gross, or 90 cents net, per 1,000 cubic feet.

MR. JOHN H. KLINGE, the newly appointed Secretary of the Spokane Falls (Wash.) Gas Light Company, is at his post. His promotion shows that promotion is usually experienced by those whose course has been of the order methodical and persevering.

MR. GEORGE B. BURDGE has been appointed Manager of the Coast Gas Company's successful appeal for the right to distribute gas in Ocean Grove, N. J.

PUBLIC LIGHTING TABLE.

DECEMBER, 1909.

Table No. 1. FOLLOWING THE MOON.

Day of Week.	Date.	Light.	Extinguish.
Wed.	1	5.10PM	9.50PM
Thu.	2	5.10	11.00
Fri.	3	5.10	12.00
Sat.	4	5.10LQ	1.00AM
Sun.	5	5.00	2.00
Mon.	6	5.00	3.00
Tue.	7	5.00	3.50
Wed.	8	5.00	4.50
Thu.	9	5.00	6.10
Fri.	10	5.00	6.10
Sat.	11	5.00	6.10
Sun.	12	5.00NM	6.10
Mon.	13	5.00	6.10
Tue.	14	5.00	6.10
Wed.	15	5.00	6.10
Thu.	16	5.00	6.10
Fri.	17	8.30	6.10
Sat.	18	9.40	6.10
Sun.	19	10.50FQ	6.20
Mon.	20	11.10	6.20
Tue.	21	1.20AM	6.20
Wed.	22	2.30	6.20
Thu.	23	3.50	6.20
Fri.	24	5.00	6.20
Sat.	25	No L.	No L.
Sun.	26	No L.FM	No L.
Mon.	27	No L.	No L.
Tue.	28	5.10PM	7.30PM
Wed.	29	5.10	8.40
Thu.	30	5.10	9.40
Fri.	31	5.10	10.50

TOTAL HOURS DURING 1909.

By Table No. 1.

	Hrs.Min.
January	212.20
February	183.40
March	173.00
April	151.10
May	144.10
June	138.50
July	145.40
August	160.30
September	180.00
October	201.00
November	216.30
December	233.40
Total, yr.	2140.30

PUBLIC LIGHTING TABLE.

DECEMBER, 1909.

Table No. 2. NEW YORK CITY. All Night Lighting.

Day of Week.	Date.	Complete Lighting in One Hour From Time Given P. M.	Complete Extinguishing in 50 Minutes From Time Given A. M.
Wed.	1	4.07	5.52
Thu.	2	4.07	5.52
Fri.	3	4.02	5.57
Sat.	4	4.02	5.57
Sun.	5	4.02	5.57
Mon.	6	4.02	5.57
Tue.	7	4.02	5.57
Wed.	8	4.02	5.57
Thu.	9	4.02	5.57
Fri.	10	3.57	6.07
Sat.	11	3.57	6.07
Sun.	12	3.57	6.07
Mon.	13	3.57	6.07
Tue.	14	3.57	6.07
Wed.	15	3.57	6.07
Thu.	16	3.57	6.07
Fri.	17	3.57	6.17
Sat.	18	3.57	6.17
Sun.	19	3.57	6.17
Mon.	20	3.57	6.17
Tue.	21	3.57	6.17
Wed.	22	3.57	6.17
Thu.	23	3.57	6.17
Fri.	24	4.02	6.22
Sat.	25	4.02	6.22
Sun.	26	4.07	6.22
Mon.	27	4.07	6.22
Tue.	28	4.07	6.22
Wed.	29	4.07	6.22
Thu.	30	4.07	6.22
Fri.	31	4.12	6.27

TOTAL HOURS DURING 1909.

	Hrs.Min.
January	428.30
February	358.15
March	353.10
April	298.10
May	263.20
June	234.45
July	248.30
August	278.00
September	311.25
October	370.05
November	397.40
December	438.35
	3980.25
Deduct on account of 50 min. extinguishing time	30.25
Total, yr.	3950.00

THE AMERICAN GAS LIGHT JOURNAL

The Market for Gas Securities.

The net result in the week's trading over Consolidated gas is a loss of 2 points, and while small satisfaction goes with the knowledge that the average decline in the general market was well beyond that experienced by railroad and other shares, it nevertheless is true such knowledge shows the inherent strength that abides in Consolidated at this time. The opening figure to-day (Friday) was 147⅜ to 147¼. Just at this period it is usual for visiting gas engineers to speak about maximum output, and all who have conversed with us (certainly not fewer than 20) in the week on the topic agree that the average increase this fall was close to double that of last fall. We presume, in view of the fact that Mr. Hughes is still Governor of the State, it is unwise to make mention of the recording of wagers, but we will chance it to say that Wednesday last a bet was made in the editorial quarters that Consolidated gas would have a maximum daily output this season of 110 millions cubic feet. In order to save Inspector McCluskey any trouble we note that the bet was a dinner for four at Sherry's.

The bond market is active at advancing figures; and we would again call the attention of our readers to the fact that Washington (D. C.) gas should be worth 25 points more in 6 months, if secured at the quoted bid.

Gas Stocks

Quotations by George W Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

DECEMBER 6.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capitol.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	147⅝	147¾
Central Union Gas Co. —				
1st 5's, due 1972, J. & J.	8,000,000	1,000	98	101
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual Gas Co.	2,500,000	100	155	165
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101⅛
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	100	101
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	104	107
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	—	75
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	143	146
1st Con. 5's, due 1948, M. & N.	15,000,000	—	91½	92
Yonkers	299,650	500	130	—
Out-of Town Companies.				
Bay State	50,000,000	50	1	1½
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	90	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	73	73½
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,000,000	1,000	104	105¼
Cincinnati Gas and Electric				
Co.	29,500,000	100	92	93
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt &				
Heating Co.	1,682,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	105
Mortgages, 6's	3,600,000	—	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	458,000	—	102	105
Detroit City Gas Co	5,000,000	50	—	50
" Prior Lien 5's	4,619,000	1,000	97	100½
Detroit Gas Co., 5's	881,000	1,000	75	80
Equitable Gas & Fuel Co.,				
Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,225,000	1,000	104⅛	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	103	103⅝
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	200,000	1,000	97	100
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis.	10,000,000	100	104	105
Preferred	2,500,000	100	—	98
Bonds	10,000,000	1,000	104	—
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip,				
due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	25,000,000	100	76	76¼
Preferred	25,000,000	100	8[illegible]	90
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	113	113¼
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104⅛	105⅛
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	100	102
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	90	95
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	100	101
Washington (D. C.) Gas Co.	4,600,000	20	350	352½
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	230	—

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Position Wanted

By Practical Coal Gas and Electrical Superintendent.

Open June 1, 1910. A-1 references.

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Position Wanted.

English (32), 14 years' experience gas works management, desires position. Thoroughly conversant with all departments. High-class references.

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By a gas man with 16 years' practical experience in the business, both water and coal gas. Capable of taking charge of works and obtaining best results. Married and open to accept position at once.

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All-Round Gasfitters Wanted by Western Gas Company.

Permanent positions for competent men.

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FOR SALE,

One Set of "King's Treatise on Coal Gas."

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FOR SALE,

Two coal gas benches of 6's, including hydraulic mains, scrubber and condenser, two 12-foot by 14-foot purifying boxes, with center seal, and gasholder in steel tank, capacity over 100,000 cubic feet, all of Kerr Murray Mfg. Co.'s manufacture. Also, one 6-foot McDonald station meter and one exhauster. Operated but 3 years and in good condition.

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One set of 4 purifying boxes 12 feet 8 inches by 10 feet 9 inches by 3 feet, in good condition, with centerseal and 10-inch connections. Also one American 8-foot station meter.

1771-tf YORK GAS CO., York Pa.

STANDARD REDUCTION FACTORS for GASES,

By Helon Brooks MacFarland, B.S., M.M.E.

Price, $1.50. *For Sale by*

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FOR SALE,

Second-hand gas apparatus in good order. Selling because outgrown. Ready for immediate delivery.

One 6-foot Tufts' Station Meter, Hinman Drum, 10-inch connections.
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NEW BEDFORD GAS AND EDISON LIGHT COMPANY,

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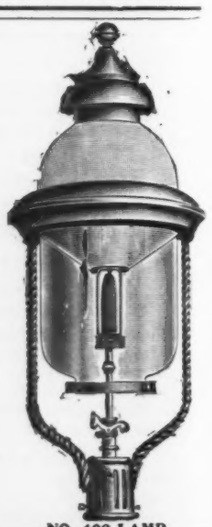

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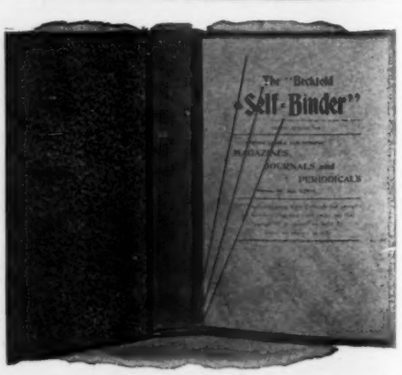

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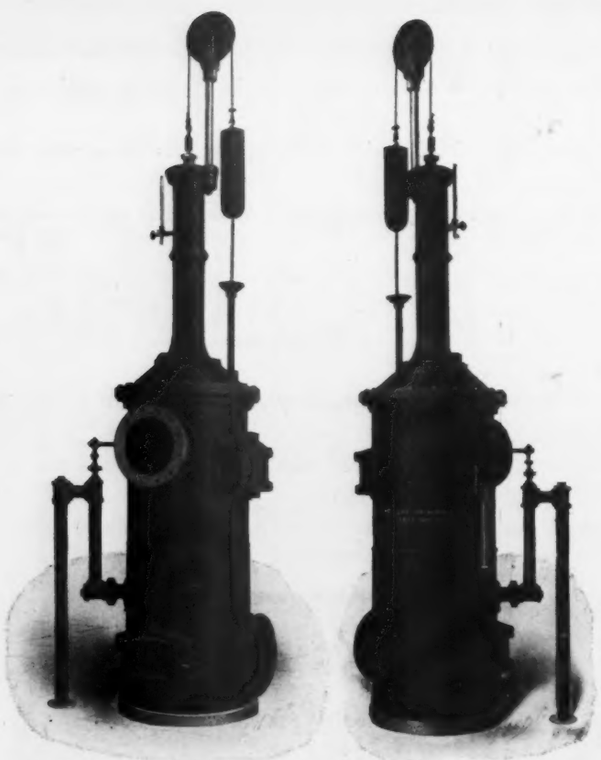

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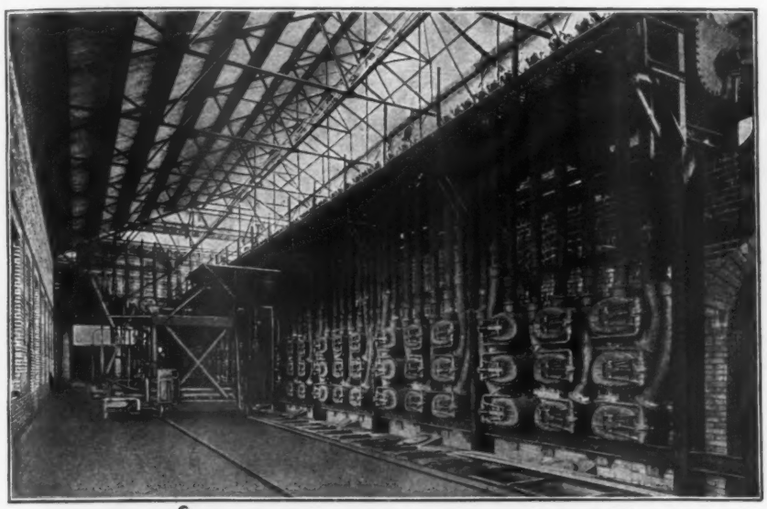

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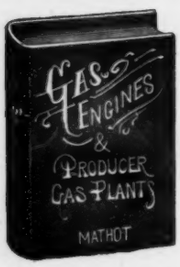

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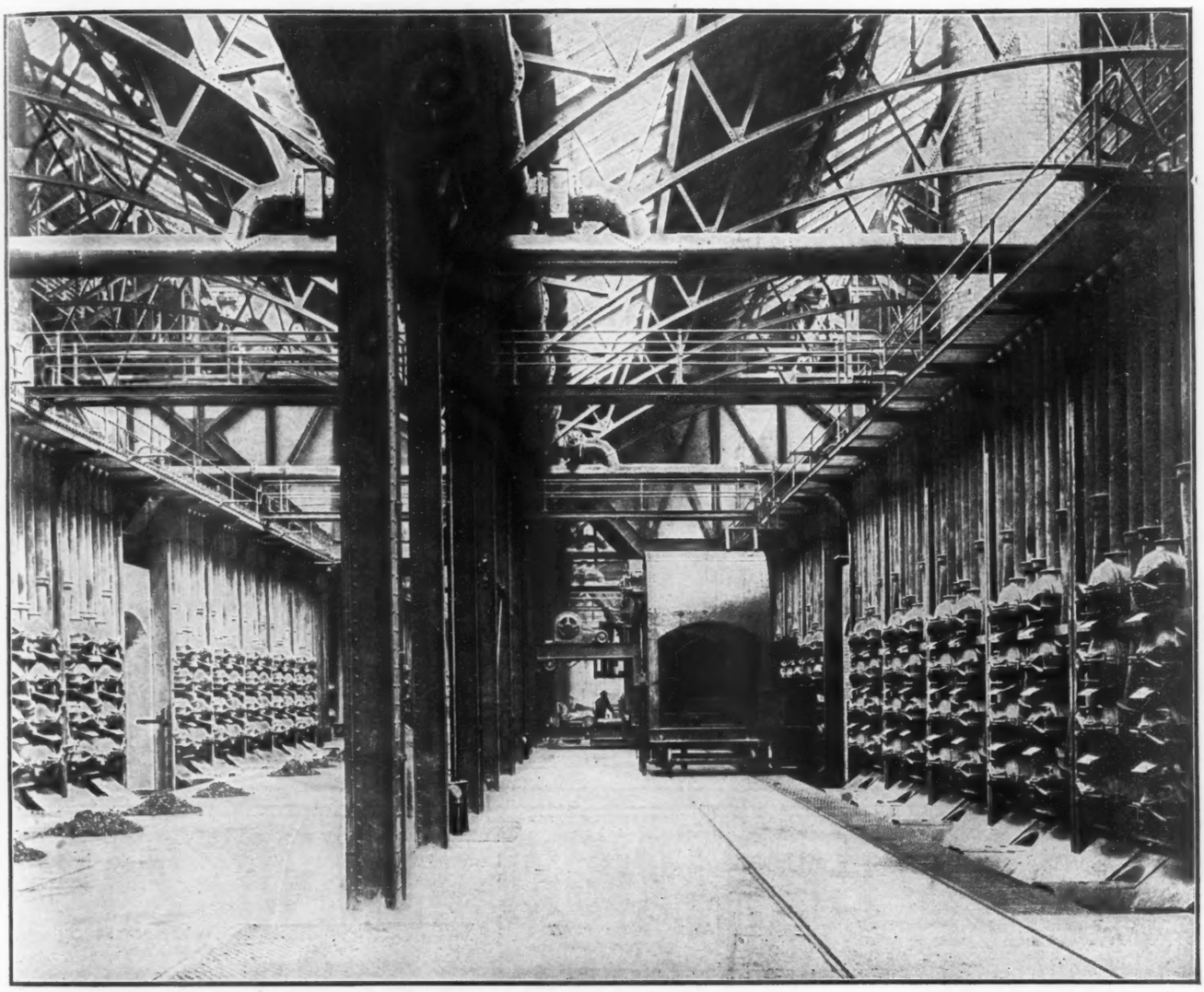

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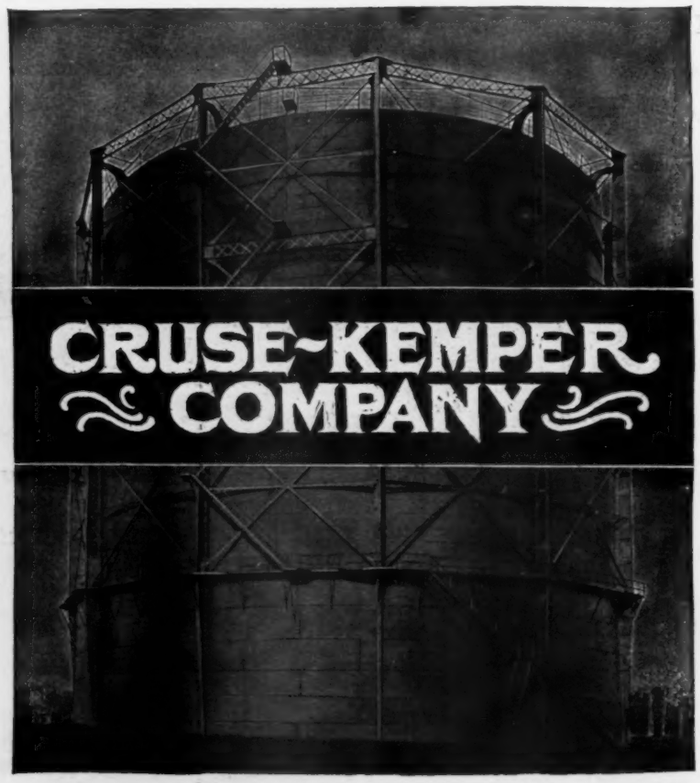

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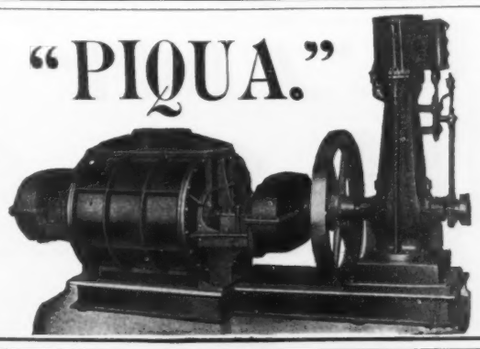

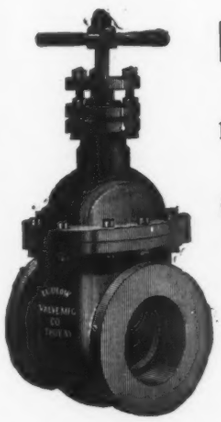

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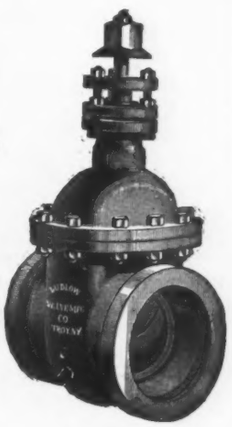

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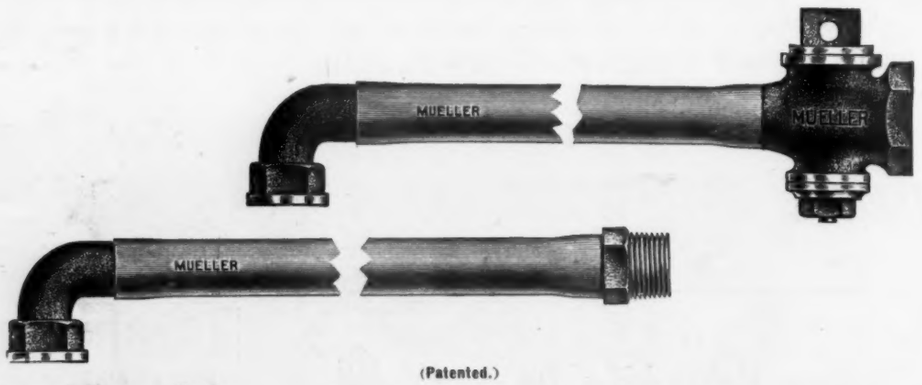

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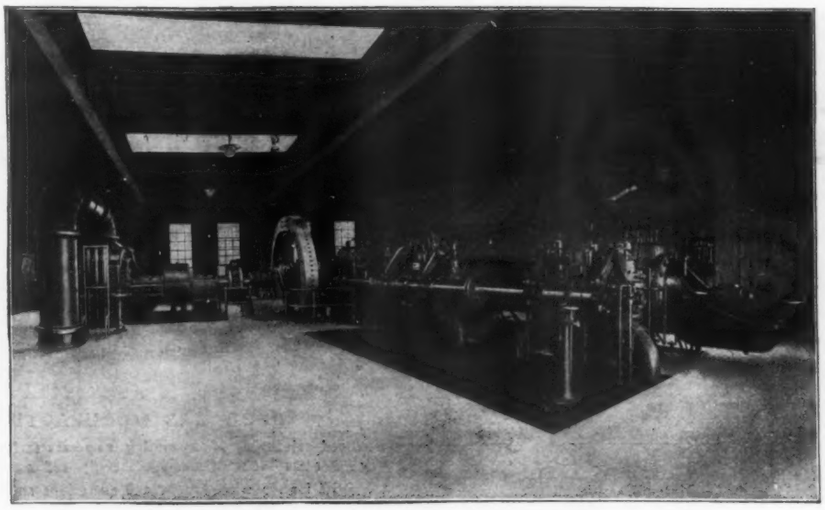

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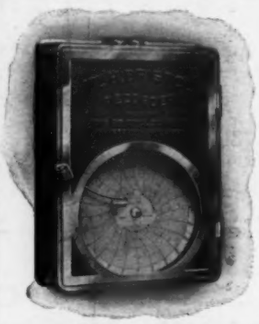

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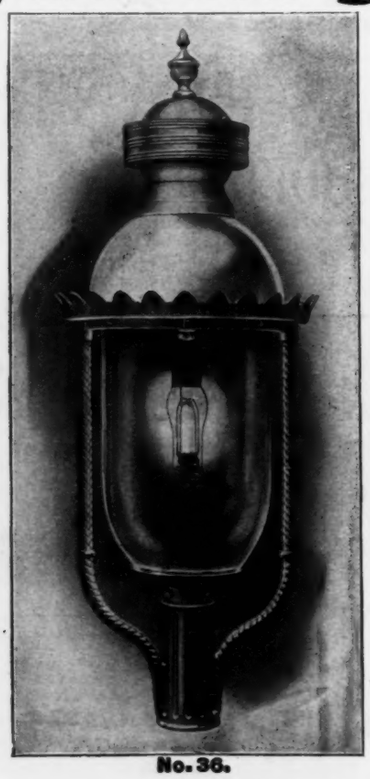

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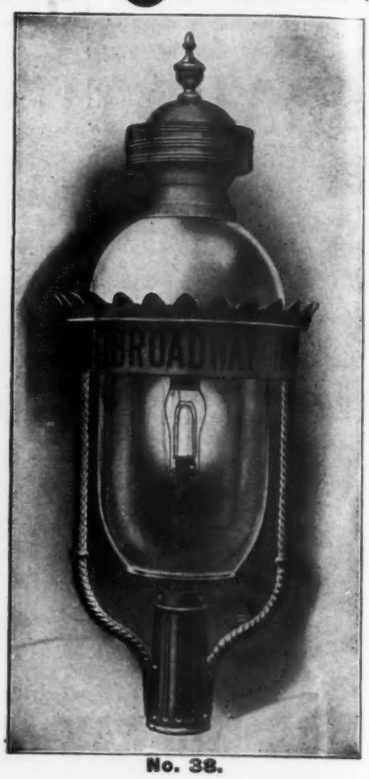

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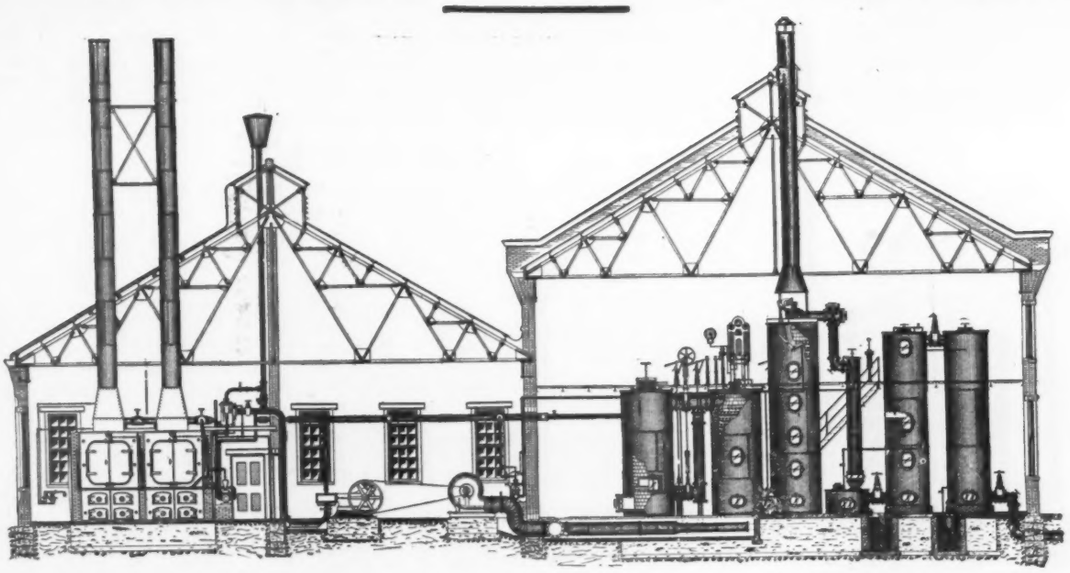

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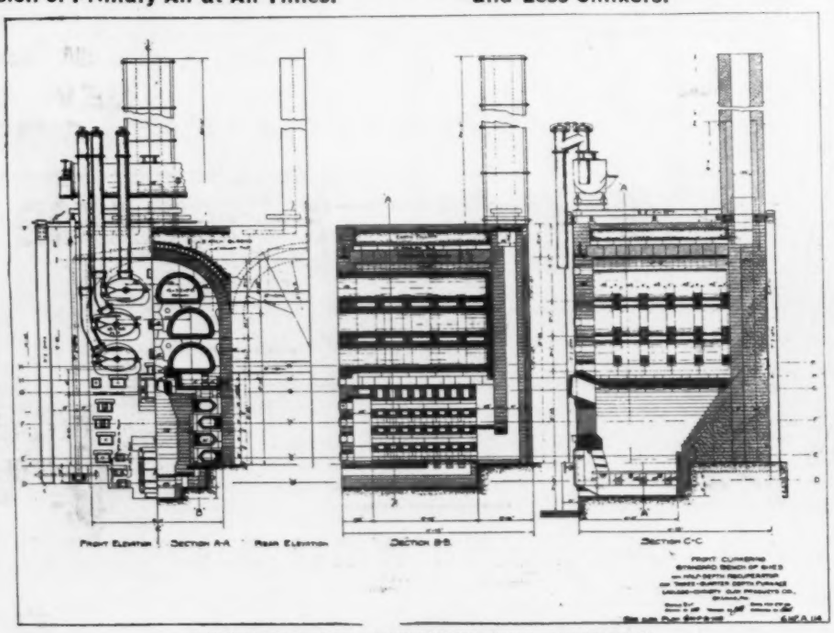

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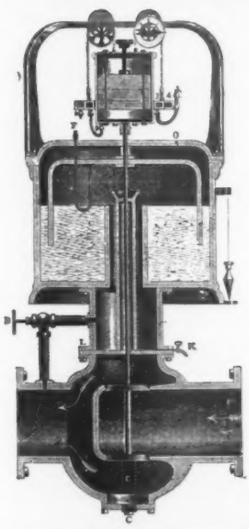

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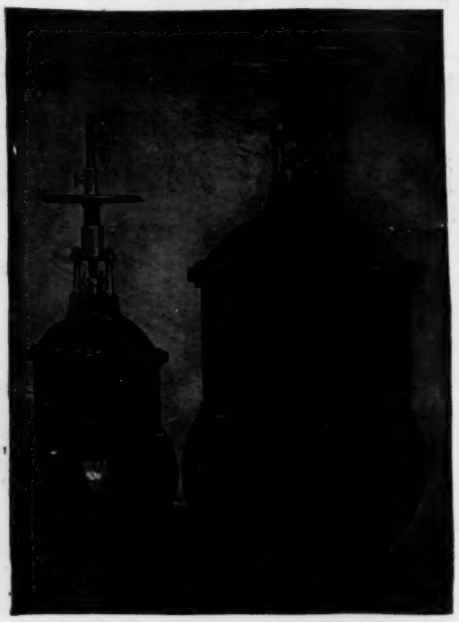

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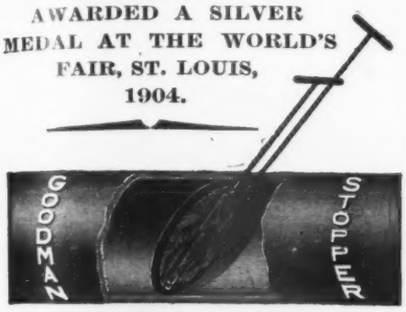

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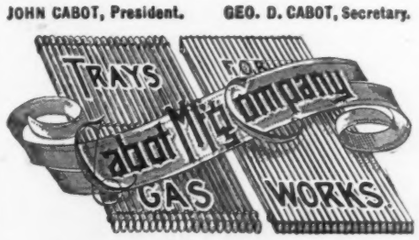

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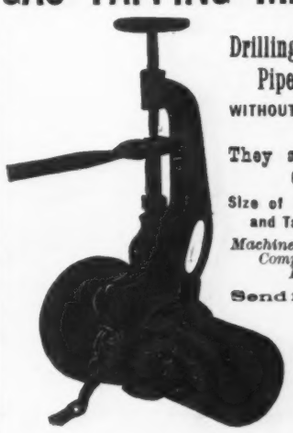

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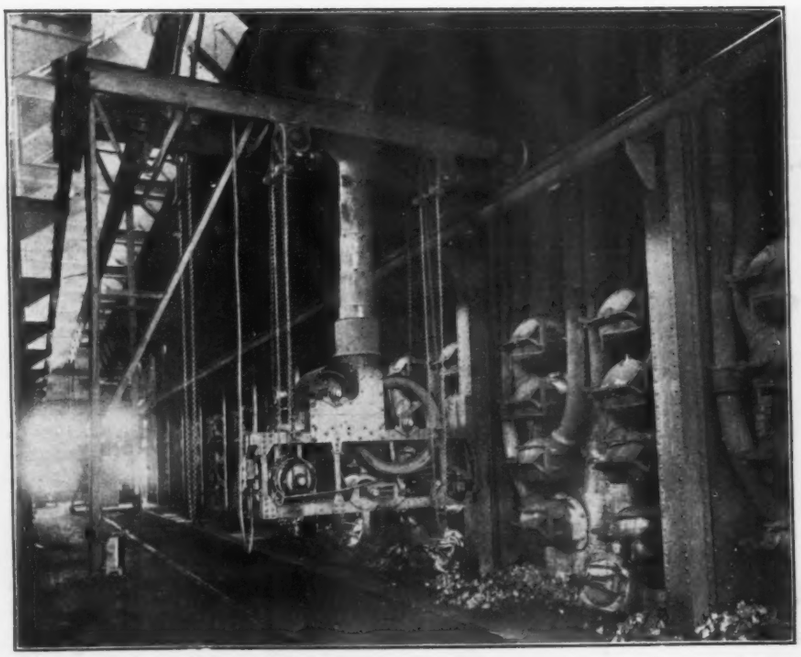

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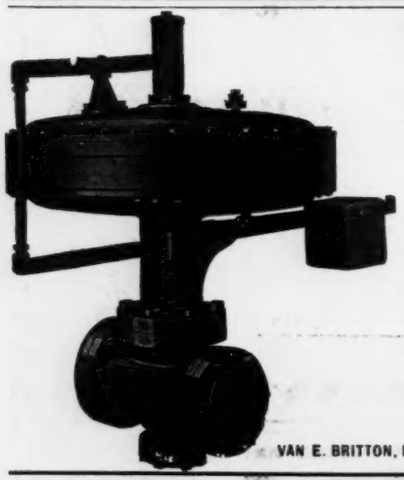

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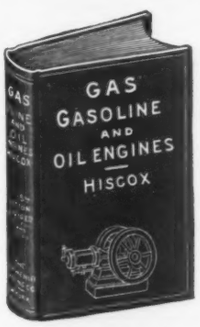

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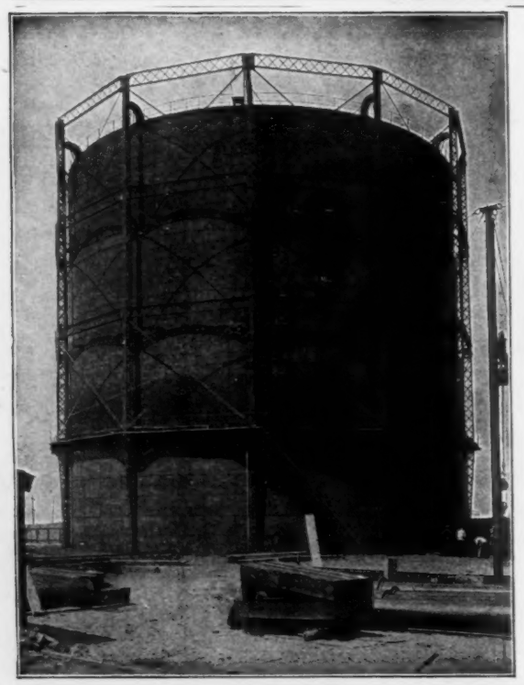

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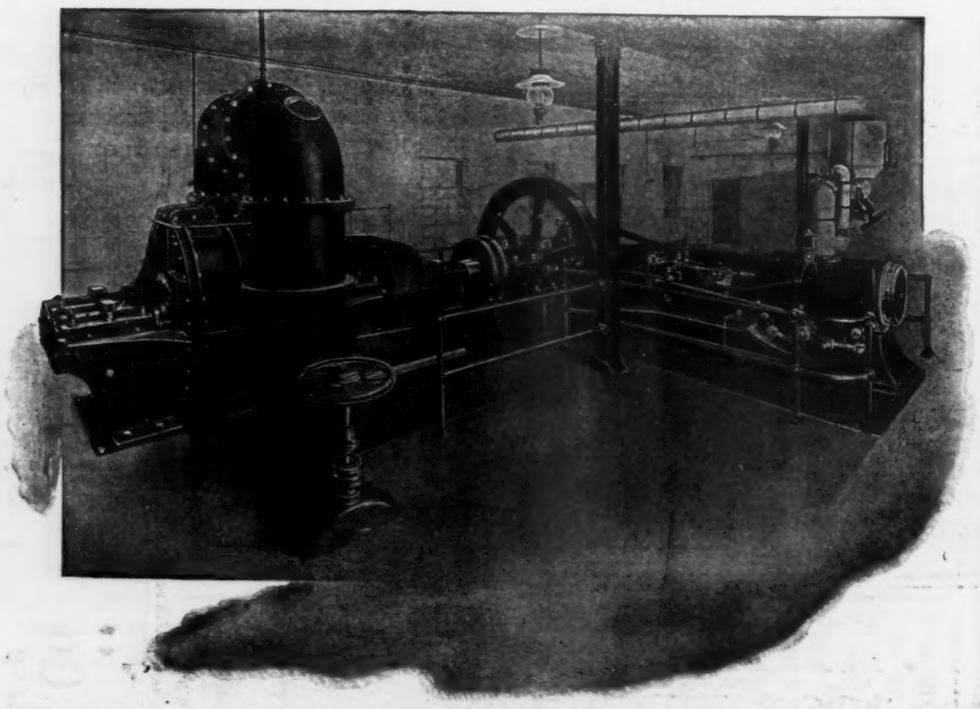

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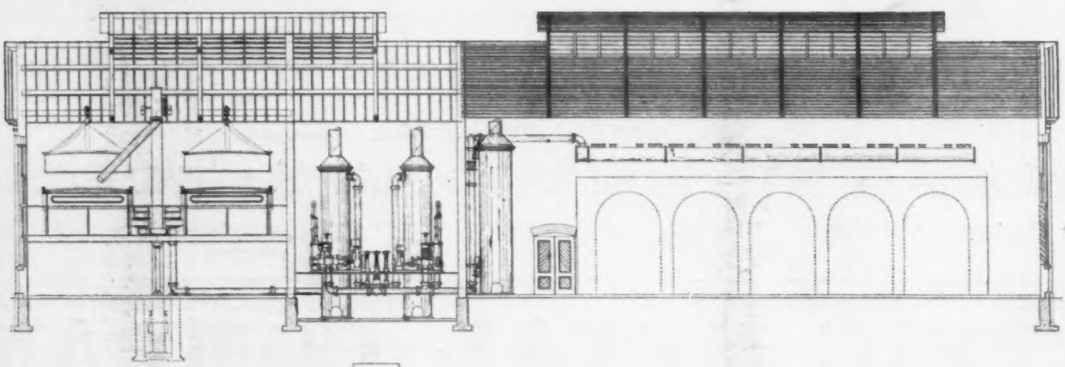

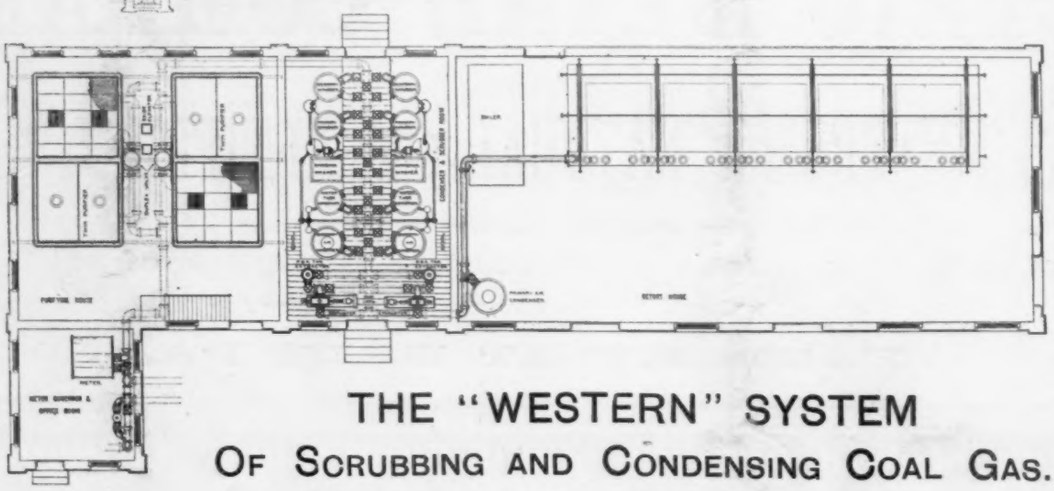

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